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Memorex Offers 3330 Replacement

By Ronald A. Frank
Of the CW Staff

SANTA CLARA, Calif. – Memorex has introduced the first complete 3330 replacement system with a plug-compatible drive, which is faster and cheaper than its IBM counterpart.

The 3670 disk storage system includes a 671 controller with up to eight 670 drives. It has an average access time of 27 msec compared with the 3330's 30 msec. The 3670 will be priced "8% to 10% below" the 3330, Memorex said.

The 3670 will be available for first deliveries in the fourth quarter of 1972. A spokesman said the unit has already been built and is operating in-house.

In addition to requiring 80% of the physical space needed by the 3330, the Memorex 3670 system has an operator diagnostics console on each drive to display the status of head and cylinder addresses. The panel indicates failure condition information in the event of a malfunction, to simplify maintenance.

The modular design of the 3670 allows faster on-site maintenance than with the 3330. Such components as head-arm assembly and power supply can be changed "in a few minutes" to save users "hours of system downtime," Memorex said.

Memorex has also developed a new Mark Ten disk pack, compatible with the IBM 3336 pack. Both packs have a storage capacity of 100 M byte. The Memorex packs are said to be fully interchangeable from drive to drive and with the 3330 system.

Digitized Birds

Employees enjoy floor to ceiling birds which provide a lighthearted computer-generated motif for the employee lounge at Computax. The company has renovated its headquarters building using mosaics comprised of photographically enlarged computer printouts. Story on Page 3.

Another Software Class

IBM to Buy Programs From Users to Resell

By Don Leavitt
Of the CW Staff

VERO BEACH, Fla. – IBM is now ready to buy operational programs from outside users to resell them under license to other users. The company has established a new class of software, Installed User Programs (IUPs), which will come either from users or from internal IBM development.

First of the IUPs announced was acquired from Indian River Memorial Hospital, here. All rights to the program, a disk-oriented patient billing and accounts receivable package for the IBM 3/10, were purchased by IBM for $4,500, according to the hospital's DP director, Mike Gossett.

Confirming that it had bought all rights to the hospital package, an IBM spokesman said this will not always be the case. The company expects to acquire software for IUP distributuion under individually negotiated contracts.

IBM approached the hospital directly for the first IUP, Gossett said. Other users who have programs they feel appropriate for the IUP plan are advised by IBM to contact their local salesman.

IUPs apparently will cover as wide a range of CPUs and uses as the Field Developed Programs (FDPs) announced earlier this year [CW, Aug. 11]. And they will be available under the same "ground rules" of limited cost to user, limited support from IBM, that separated FDPs from IBM's standard Program Products.

12-Month Charge

An IUP user will be charged only for the first 12 months of use, although he will remain under the limitations of IBM's normal license agreement as long as he uses the program.

For its part, IBM will provide any necessary "error correction information," but only in newsletter form, and only for the first six months after the IUP is initially released. No centralized programming support, enhancements or on-site help will be provided by the company.

The distinction between IUPs and FDPs rests in the origin of the programs. The FDPs are, by definition, developed by IBM's field personnel specifically for the FDP program. To be distributed under IUP, programs must be fully installed and in use, either at IBM or an outside user site.

(Continued on Page 4)

Critique of Detroit Fiasco

ACM Releases DP Voting Report

By Edward J. Bride
Of the CW Staff

NEW YORK – A guide to avoiding problems likely to occur in any voting district switching to computer format is now available from the Association for Computing Machinery (ACM) here.

Based on the delays and discrepancies of the 1970 Detroit elections, the ACM study documents claims that the November election, like the August primary, was a "fiasco."

ACM's committee said there were instances in which a person could vote twice for the same candidate, that there was no feasibility study performed before the election, that card readers performed at about 10% of capacity, and that "an organized conspiracy cannot be ruled out" as cause of the myriad problems.

The investigation was requested by ACM President Walter Carlson, and was headed by Fred A. B. Gluckson, chairman of the association's Detroit chapter, who turned in the study last spring.

The document is available to "people with a need to know" the potential difficulties, an official said at ACM headquarters, 1130 Avenue of the Americas.

How-Not-To

The document covers 42 pages, plus over 200 pages of appendixes which include copies of correspondence between ACM and Detroit City Clerk George Edwards, and election rules, sample ballots, and instruction booklets.

The full study comprises a "how-to" manual on the computerization of an election, and a thorough analysis of Detroit's "how-not-to."

Detroit officials still wince at mention of the 1970 elections, and would only comment last week that a "more than tentative" decision had been made to return to the conventional Automatic Voting Machines (AVM) for the 1972 presidential election.

Gradual Introduction

One of the ACM recommendations was to introduce any new election systems gradually, a few precincts at a time.

Detroit actually had a trial-run in one district long before the November election, and even before the primaries, but that test was to measure public acceptance, not system performance.

The ACM committee claimed its investigation was hindered by the impounding of election materials, pending a damage payment by the vendor of the system, Datamedia Computer Services Inc.

Partially as a result of this impounding, it has not yet been established whether punched card voting is an "adequate replacement for the AVM," the report commented.

Errors in all Facets

Errors were uncovered in virtually every element of the Detroit system, including late rules changes which precluded public testing of required software modifications.

After the primary a card-to-tape run was set up to replace the direct reading of ballots,

(Continued on Page 4)

Registrations for RCA Users Meeting Surge Ahead, All Await RCA Policies

By Michael Merritt
Of the CW Staff

MIDDLETOWN, Pa. – Registration for the Oct. 25 meeting of the RCA Computer Users Association is running far ahead of registration for previous meetings, according to Association President David L. Rau.

The meeting is expected to be based on a statement by RCA officials of their plans for support of computer users.

The controversy surrounding RCA's departure from the computer industry, coupled with its indecision over support policies, accounted for the surge in attendance, Rau said. He predicted over 300 RCA users will attend the San Francisco meeting.

Rau said last week he had not received an official response from RCA to his request that RCA define its support policies at the meeting [CW, Oct. 13]. RCA has replied to Rau's letter, a company spokesman said.

The conduct and schedule of the meeting will depend on RCA's response, Rau said. The first general meeting Monday morning has been set aside for the RCA statement. The agenda for the remaining two days will be changed, depending on RCA's position, Rau said.

"We want to know where we stand by Monday noon," he added.

The user group president said users were finally beginning to receive the letter from RCA Chairman Sarnoff describing RCA's near-term plans [CW, Oct. 6]. The letter was drafted late in September.

According to Rau, "So far nobody's panicking." Users "are assuming that they will be able to work something out, and that RCA will behave in a professional manner."

Registration for the meeting can be made by writing to E.E. Andrews, RCA CSD – Guest Relations, Building 202-1, Cherry Hill, Camden, N.J. 08101.

On the Inside

Computerized Graphics Decorate Walls in Remodeling Computax

EL SEGUNDO, Calif. – Designs – digitized, computer printed, enlarged, and silk screened – were an integral part of an interior design program for the new offices of Computax Corp.

The artistic concept and specialized computer programming were worked out by Bob Morgan, graphics designer, and Bill Miller, architectural systems engineer, of Albert C. Martin and Associates, an architectural, engineering and planning firm.

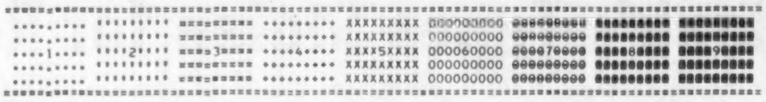
The computer graphics technique was created to meet specific interior design needs for the main reception area at Computax. Morgan felt it important to reflect the company's business, computerized tax returns for professional tax return preparers, and to present a strong computer image to non-computer people who make up the bulk of reception area traffic.

Other graphics throughout the building were designed to be both visually accurate and appealing to employees.

Initially, the design for the reception area wall incorporated a giant-sized painting of computer symbols and equipment. During early concept stages, however, Miller and Morgan decided to investigate possibilities of using actual computer printouts as the "tiles" for creating a mosaic.

Symap, a computer mapping program, was purchased from the Harvard Laboratory for Computer Graphics. Miller then took Morgan's original line drawing and digitized it, assigning symbols for various points on the line drawing. In essence, the technique is similar to painting by the numbers.

Varying density of lines and areas was achieved by the use of 10 different symbols, ranging from a period to an overprinted O, V, A and X pattern approaching total black.

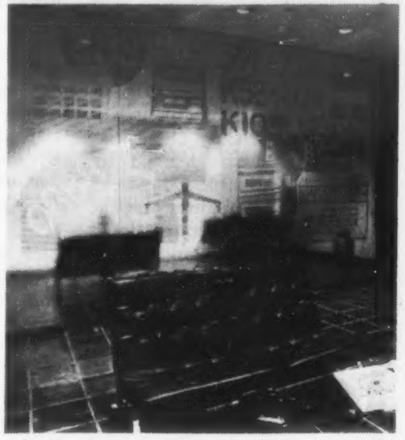


These nine shades of computer-generated gray are used in the mosaics. The darkest is formed by superimposing the letters O, V, A, and X.

The mosaic was divided into five vertical sections and printed out on a Univac 1108. Then each section was "blown up" three and a half times original size to obtain full coverage of the 9 ft by 18 ft wall. As a result, the vertical height of each symbol is approximately 3/8 in.

The enlarged mosaic pattern was silk-screened onto sheets of mirror-finished Mylar. Sections were then matched much the way wallpaper is matched. The Mylar material is wrapped completely around 3/4-in. plywood panels to prevent possible slippage of individual sheets.

The finished mosaic is demountable from the reception area wall and can, if necessary, be moved from location to location.



Reflective computer motif forms wall in reception area.

Phone 'Phreaks' Just Can't Tap Data Line Alone

By a CW Staff Writer

NEW YORK – If you're a time-share user, "phone phreaks" could be tapping your lines. But before you panic, bear in mind that any unauthorized random data they manage to "copy" will have to be accessed with the help of phone company employees.

AT&T describes the phone phreaks as "young bright student types who are interested in seeing what they can do with the network."

Unauthorized access to the telephone network is documented in a current *Esquire* article that describes how phone phreaks are making toll-free, world-wide calls with the help of multi-frequency tone-generation devices commonly called blue boxes that are illegal.

Part of the article describes how blue boxes enable anyone to get into a verification trunk to gain unauthorized access to local lines.

According to the article, blue box operators can generate the proper multi-frequency tones to connect them with special verification operators.

After convincingly telling the operator they are "switchmen from other area codes testing out verification trunks," the phreaks are tied into the verification trunks. They are then free to access a number falling under the trunk, the article says.

AT&T calls the process "highly improbable." Data system verification trunks do exist and do have to be accessed by verification operators, according to a Bell spokesman.

But the connection of an unauthorized blue box phreak into a verification trunk would require inside help, the company said. Authorized switchmen must give proper codes which are changed at regular intervals, AT&T added.

Even if a phreak got into a data verification trunk, he would need a compatible modem, data speed, and format to detect what was being transmitted.

Since a verification trunk works only when two parties are already using a line, the chances of a phreak intercepting a user's password are remote. He would have to cut in after a user called the time-share computer but before the password was sent.

Random access of a line carrying data requires inside help, and a multi-frequency tone unit can't be used to access a busy circuit as it works only on an idle circuit, AT&T said.

Bank's Tapes Stolen for Ransom

By Edward J. Bride
Of the CW Staff

LOS ANGELES – You don't have to capture a computer center to try to collect ransom from a big computer user . . . just steal his tapes. But if those tapes are merely copies and not original data, then the whole ploy is a crime without chance of success.

That's the lesson learned by the people who stole a shipment of checks and computer tapes at the Los Angeles International Airport.

Canceled checks with a face value of $1.8 million, plus the two reels of magnetic tape, were contained in one of the six bags in a shipment between Bank of America offices in September. Bank officials noted a bag was missing and reported the theft to police.

An informant reported the stolen property might be located on a private boat in Los Angeles harbor, and U.S. Customs officials made two arrests, assisted by the Los Angeles Police Department.

James Johnson, security officer at the Bank of America's offices here, said an attempt had been made to "ransom" the checks and the tapes back to the bank, which would not accede.

The bandits were "misinformed" about the value of their haul, in the first place, Johnson said. They apparently thought the bags contained negotiable securities and/or tapes with unprotected data, he observed.

But the data was backed up by the bank's duplicate tapes, he added, stating, backup is always created "in case of theft, just like this, or loss."

Had the police been unable to crack the case, the only loss involved would have been by bank customers who wished to preserve the original hard copies of their checking transactions, most of whom would have understood, Johnson added.

ACM Releases Computerized Vote Report

(Continued from Page 1)

with the corresponding modification to the single program into two programs: a card-to-tape program and another to count.

Many of the November problems, however, were separate from the card-to-tape run. Loose chad left a question as to some voters' actual intentions, and even now an audit could not verify the election since many of the ballots were re-punched, by hand, by election workers.

One estimate held that 2,000 man hours of effort went into manually duplicating 20,000 ballots.

There were also delays checking into counting centers, leaving computers idle during the scheduled counting period, and "loss of the computer back to the host company when the input began to flow," the report said.

Further card problems occurred when a "mysterious" hole was punched in one ballot position, of several hundred cards, crippling the card-to-tape portion.

Regarding performance of the card readers, ACM noted the card-to-tape program had a demonstrated capability of reading input at 1,000 card/min.

Yet, the average rate for reading the August ballots was only 45 card/min, and in November, 120 card/min. For about three hours, however, the equipment did sustain a rate of 250 card/min in November.

Part of the loose chad problem apparently stemmed from design inadequacies in the voting device, resulting in its failure to meet the close tolerances necessary to avoid punctures and hanging chad.

Any attempt to change voting methods should be preceded by a meaningful feasibility study of the total election process, and this was not done in Detroit, the committee since proposed guidelines for such a study.

Among points to be fully evaluated are election laws of state and local governments, current voting media and possible effects on voters, costs, reasons for changes, time requirements, logistics (a complete understanding of the boundaries involved and any inherent problems), and equipment requirements, including hardware, software and special devices.

The foundation for ACM's ombudsman program. designed to find and right alleged or real computer wrongs, can be seen in one portion of the Detroit election study.

The President of the Common Council is quoted as reporting "no great hue and cry from the public – or from anybody – recently on what went wrong. And there is a certain wisdom in letting sleeping dogs lie."

The ACM committee responded: "It is precisely this kind of disinterest in the rights of the public to understand the functioning of Government that led ACM to prepare this report on the election."

IBM Will Buy Software for Sale

(Continued from Page 1)

The IUP from the local hospital will be available in two parts from IBM in December for $60/mo for each part, or $1440 for both over the 12-month payment period. To function, however, it requires the concurrent use of one or both of two standard Program Products: the card-oriented Hospital Patient Billing and the card-based Hospital Accounts/Receivable packages for the 3/10.

The Patient Billing program costs $65/mo, while the Accounts Receivable package costs $35/mo. These in turn require the use of IBM's RPG-II compiler ($45/mo) and the 3/10 disk sort ($10/mo).

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News Wrapup

User Files IBM Price Complaint

RESEARCH TRIANGLE PARK, N.C. – A formal protest has been filed with both the government and IBM against IBM's July purchase-price increases, with the user claiming the increases violate the price freeze.

Dr. Leland H. Williams, president and director of the Triangle Universities Computation Center (TUCC), said IBM's refusal to quote him purchase prices effective before July 28 violates the freeze, since he doubts IBM has done the substantial business required in the prior 30 days.

IBM refused to comment on Williams' complaint. IBM has also refused to say whether it has made shipments at the increased prices.

TUCC, which serves three area colleges, Duke and North Carolina State Universities, and the University of North Carolina at Chapel Hill, wants to purchase a CPU for its leased 165 and some other gear at the old prices. The CPU has an old price of $1.4 million, but IBM has quoted the new price of $1.6 million, he claimed.

The Office of Emergency Preparedness said its local officials in Greensboro would investigate Williams' complaint, and if it is determined that a violation of federal guidelines exists, IBM would be given an "opportunity for voluntary compliance."

Report Clears IBM in Smithsonian Blaze

WASHINGTON, D.C. – A government panel has finally handed in its report on the fire in the Smithsonian Institution computer exhibit over a year ago, but reached no conclusions. The District of Columbia Fire Department had said then that the $750,000 blaze was caused by an explosion in an IBM 2260 CRT terminal on display, [CW, Oct. 7, 1970], but the report said it was "improbable" that the fire was caused "by commercial equipment which was on display in the area," according to Richard Ault, executive officer of the museum.

Although portions of the report remain "privileged information," Ault said the cause of the fire "cannot be established positively," adding the most probable cause was "of electrical origin." But the committee apparently did not get more specific.

Congressman Scores Release of VA Lists

WASHINGTON, D.C. – Rep. John R. Rarick (D-La.) has accused a federal judge of endangering the right of individual privacy by ruling that the Veterans Administration must disclose the names of ex-servicemen who served in Vietnam to an antiwar group, the Vietnam Veterans Against the War.

"This decision," said the congressman, "is but another classic example of the officious intermeddling into the life and thought of every American citizen.

Police Identify Bludgeon Suspect

FARMERS BRANCH, Texas – Police have arrested Gene Oliver, 32, in connection with the August killing of Billy Cletus Barnes, who was bludgeoned at a meeting discussing opening a DP school [CW, Sept. 29]. Larry Patterson, the alleged murderer, has been identified by police as John Cramer Jackson, and an all-points bulletin has been issued for his arrest.

747 Unit Cools University's DP Center

GAINESVILLE, Fla. – When the regular air-conditioning unit for the University of Florida's DP center broke down, university officials managed to hold student registration on schedule by installing an air-conditioner used for jumbo jets when they are on the ground.

The jumbo jet unit had "three times the tonnage needed to air-condition the building," but it delivered its cooled air through one 10 inch hose, according to Ron Schoenau, director of computing systems at the University of Florida.

1 Million Records

Trauma File Aids Patient Care

By a CW Staff Writer

CHICAGO – A medical file similar to the FBI's crime data bank, and approaching its size, is being built by the University of Illinois Medical Center here. The system records medical "events" or traumas and files them by the name of the patient, much as the FBI records "contacts" with the law, then files them under the name of a suspect or criminal.

Headquartered at the medical center's Research Resources Laboratory, the file is known as a regional trauma unit [CW, June 16], and officials have predicted that as many as 1 million records will be stored on-line within four years.

There is no direct link with the FBI system, other than the method of collecting data and the fact that statistical studies can be made in addition to the compilation of individual records.

Death and disability from severe trauma constitute a major health problem and the most common cause of death under the age of 40, officials state. A comprehensive analysis of patients admitted to emergency care facilities is now available.

The center recently upgraded its IBM 360/44 to a 370/155, in order to accommodate the increasing files, among other reasons.

About six other users employ the same retrieval software as the trauma unit, which is based at Cook County Hospital and the Research Resources Laboratory, according to David M. Rappaport, director of the center.

Improve Patient Care

The trauma registry will facilitate and improve patient care by rapidly retrieving data relevant to a patient's present clinical problem, noted Rappaport and Dr. D.R. Boyd, of the medical center's department of surgery.

The system also provides on-line clinical summaries of specific diagnostic and therapeutic methods, and makes available a data source for developing at-risk factors for specific accidental events.

Other functions include defining the variables on which patient morbidity and mortality depend, determining specific logistical and manpower requirements for a given community's trauma needs, and estimating expenditures for certain injuries and their comprehensive care requirements.

Data is entered and retrieved by dataphone and video display terminals. All information is protected by passwords, and is available only to authorized users.

The software for the trauma registry and the six other users is a commercial package from Computer Corp. of America, (CCA), known as the Series 100 Information Storage and Retrieval System. CCA is in Cambridge, Mass.

Each record in the growing data base corresponds to a single patient, and contains up to 840 fields of data. Rappaport said the file is expected to increase by 50,000 to 100,000 patients a year.

Like the FBI data bank, statistics can be compiled, as well as using the "live" data for solving actual problems.

'No Aging Criteria'

Also like the FBI system, there is "no aging criteria" to the data, Rappaport commented. This results in "ever increasing" files, both in numbers and in size of individual records.

Most of the software for the 360/44 was upward-compatible with the 155, including the retrieval package from CCA. Rappaport said the 155 is "five to 10 times faster" then the Model 44, which also operated under full OS.

School 'Flunks' DP As Class Scheduler

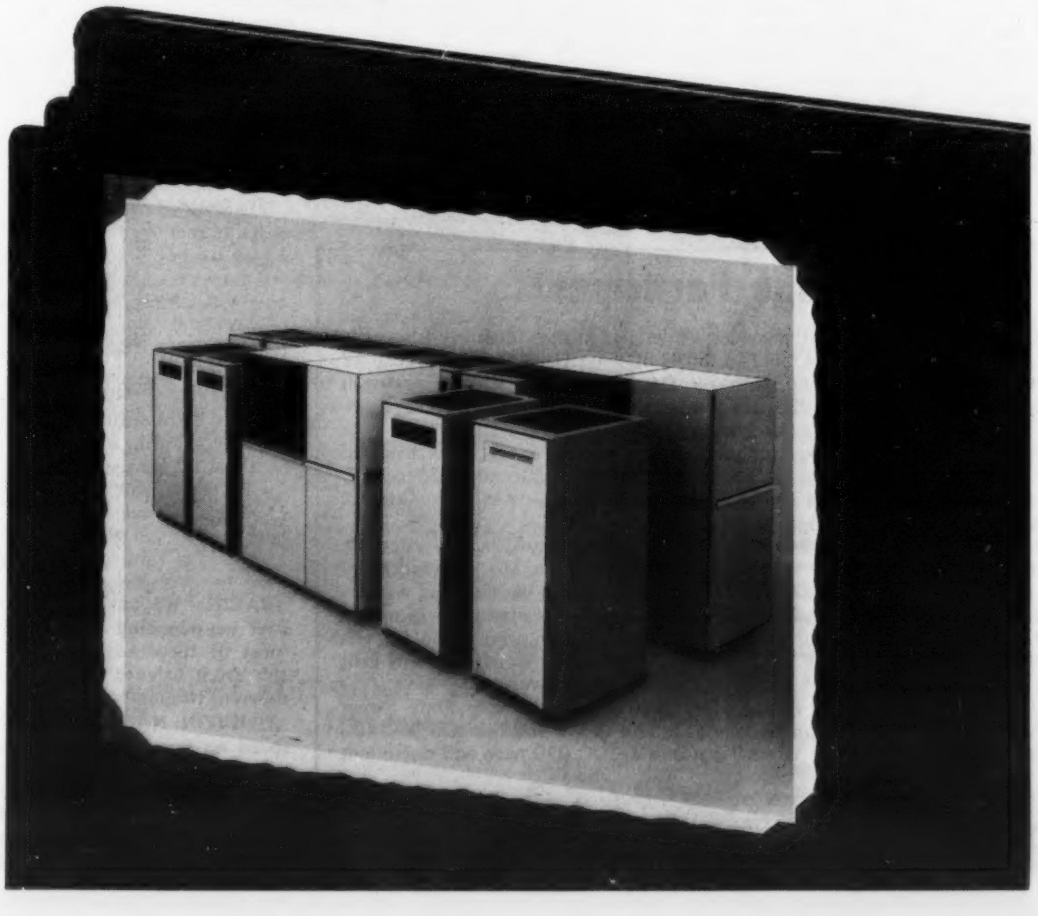
Special to Computerworld

SEATTLE, Wash. – "Computer Flunks at Enrollment" was the reaction in the local press to the decision by Thomas Jefferson High School in nearby Federal Way to abandon computerized scheduling of students. It "just didn't work satisfactorily," said Principal Ted Hagen.

The school was the only one of over 80 schools in the greater Seattle area to reject computerized scheduling entirely, although about seven others adopted a compromise technique called "tennis shoe scheduling" in the gymnasium.

Computerized scheduling failed at Jefferson High because students were forced to make their class selections in February for the following fall, according to Principal Ted Hagen. Changes in enrollment and student decision-making made the schedule inaccurate by fall, and resolving those problems nearly wasted the first month of school, he added.

In addition, Jefferson High's curriculum is largely elective, making a rigid schedule more susceptible to failure, Hagen said.



Keypunch Replacement Forum — Part III

Users Discuss Their Conversion Problems, Solutions

The problems of replacing keypunches with key-to-magnetic devices are the focal point in Part III of the *Computerworld* User Forum on keypunch replacement.

In the first two parts, the users related the criteria they used to justify replacing keypunch equipment and to choose systems to meet their needs.

This week, the users discuss parallel testing, operator training, and the role of supervisors as well as individual conversion problems.

Although brand names were mentioned during the forum, readers should keep in mind that not all types and makes of keypunch replacement equipment were represented and that products have changed since the forum was held last summer. The sole purpose of the forum was to give readers a chance to learn from the experiences of other users.

CW: There must be one major problem of conversion that each of you had to face.

WINSHIP: I guess in our case it was probably supervision. I have a small keypunch installation with about 15 girls, with a working supervisor on each shift.

The supervisor on the second shift, as an illustration, did far more keypunching than she did supervising. With key-to-disk, that supervisor is busy getting the batches ready, etc. Supervision is different because now you have a computer in the middle of it.

Previously the [first shift] supervisor would sit there and would have the work at his desk. When a girl finished up, she would come and get something else and go back and sit down. He spent a lot of his time getting the gals' results; i.e., how long did it take her, how much did the cards weigh, how many were there, etc., and getting all this logged. The Key-Edit does all that for us now.

The supervisor's job is essentially far more to supervise with Key-Edit than with the 029s.

TIERNEY: One of our biggest concerns in converting to a key-to-magnetic system is the actual conversion of this input into another format. We would like a tape that comes off the key-to-magnetic system in the same format as the output of card-to-tape runs. When we go card-to-tape, we don't just reproduce those cards on tape. We do a lot of editing. We'd like to build those edits right into the key-to-magnetic system before we bring it in.

However, we realized a lot of our work is run in COS [Compatibility Operating System] for 1401, 1410-type work. To dig into these programs [only to] find documentation that is way out of date, [makes conversion] a real bear of a job.

Faced with either digging in that way, or putting off a decision and going with COS a bit longer, we have another alternative, to produce a tape format which has unblocked 80-byte records on it. I think we can save money by doing this, obtain a faster conversion, and still gain 80% of the benefits we are shooting for with a key-to-magnetic device.

[Otherwise, you are faced not only with new key-entry procedures, but a redesign of coding forms, in which case I'd rather put the application onto OCR and take the responsibility out of the keypunch area altogether.]

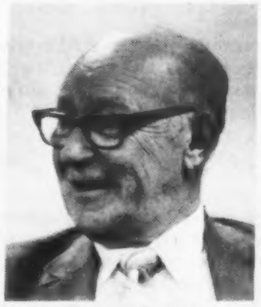
LAWTON: One thing we overlooked when we went to the key-to-disk devices, we had forgotten about our header problems. For some reason when we first went to computers, to 1401s, it was recommended to us by consultants and IBM that we use a nonstandard, 120-character header. With these key-disk devices you get an automatic header, but it's usually a regular 360 header. When we make the tape now that's going to the 1401, and we have two or three a day, we have to key our 120-character header in through the supervisor's console.

NOAH: We had very few problems. Everything went very smoothly. Part of it was because we had two good supervisors. There isn't any question that when you put batches onto a drum and then have to peel them off, there's always a chance you'll peel the same thing off twice. Or that you won't peel something off that you should. You either get something doubled or duplicated, or left out completely. They have to watch it very carefully.

The area where we had the problems was because of the computer system, the Honeywell. Everything had a banner character and neither the Mohawk as it came in originally or the Key-Edit was capable of putting a banner character on a record. Mohawk was able to do it by adding an extra character. Key-Edit inferred at the time that we ordered it that by the time we had the equipment in, they might be able to do something about it. But they just never could do it. They never could get a banner character on their tape.

We got around it because probably 85% to 90% of the work coming through the Key-Edit system and going into the Honeywell system goes through a sort first. It was a very simple matter to change the parameter cards so the sort would accept unbannered tapes in and put banner tapes out. For the other 15% of the time we wrote a Honeywell Cobol program that would accept either a bannered or unbannered tape and put out the opposite. That was the biggest problem we had.


Robert Babin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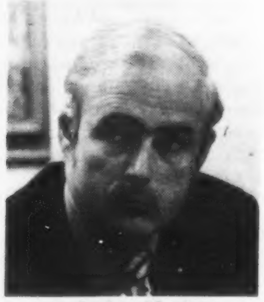
Arthur Morley


Samuel Noah


David Tierney


Lawrence Winship

Software was late coming through. In fact, we are just getting some of it now. I am used to it because I've been in this business long enough to know that all the companies all fall flat on their face when they promise a lot in the way of software.

We kept one Mohawk machine for the purpose of making corrections because we found it was easier to make a correction on a Mohawk than it was to try to make a correction on the drum. To use our software to make a correction on the drum, we had to know the batch label and that it was the 64th item on that batch. Then you could probably correct it. We found that we couldn't do it. Well, that was an added expense to us.

CW: What type of backup is necessary when converting from keypunch to key-to-magnetic input? Do you need to keep some keypunches for awhile? Or can you switch overnight? Should you switch by application and eventually phase out your keypunches? If so, do you need to increase your personnel termporarily?

WINSHIP: Ours went by application, by shift. We had a month conversion period, putting up one application at a time.

We did very little as far as resystemizing went. We kept the 80-character record.

I think we have to recognize that any conversion is something that is helping [the] data processing [department] more than the user. So our customers could care less how or when we convert. That's our problem, as long as we are putting out the work for them on time and correctly. The conversion is just an added burden. In our case, we had to send some work out to be done during that period. We had a service bureau backing us up. We did some overtime work, because when the gals are training, they obviously are not keypunching. So if they were working at 100% efficiency before, you had better recognize that there are some training requirements.

CW: Did your manufacturer help you?

WINSHIP: They did an excellent job of training our girls. On our time, on our equipment. They came in on the second shift to train our second shift. They didn't require the operators to come in on the first shift.

But we did underestimate the learning curve. This was in spite of the fact that Consolidated had a good girl on. She was a fine instructor, was very competent, and did a good job. The learning curve

(Continued on Page 7)

Meet the Participants

ROBERT BABIN, data input manager, American Mutual Liability Insurance Co. His installation includes a 360/40, an H-800, an H-2200, an H-8200, 17 keypunches, nine verifiers, two Mohawk Data Recorders, three Honeywell Keytapes, and a Farrington 3030. He was one of the two users seeking more information to help him make a purchasing decision.

EVERETT LAWTON, manager of data processing operations, New England Power Service Co. His installation includes a 360/50, a 360/40, a 7010, two 1401s, a 1460, 22 keypunches and verifiers, and 16 Redcor Key-Logic (key-to-disk) stations.

ARTHUR MORLEY, assistant chief, Bureau of Analysis and Processing, Massachusetts Department of Corporations and Taxation. His installation includes a 360/40, a Univac 9200, and 113 keypunches and verifiers. He was the other user seeking more information to help him make a purchasing decision.

SAMUEL NOAH, manager of data processing, M&M Transportation Co. His installation includes a H-200/1250 and a Consolidated Computer Key-Edit eight-station system.

DAVID TIERNEY, systems engineer for hardware evaluation, State Street Bank & Trust Co. His installation includes a 370/155, a 360/50, two 360/40s, two 360/30s, 27 keypunches, 13 verifiers, and a CDC 915 page and document reader.

LAWRENCE WINSHIP, manager of data processing, GTE Sylvania Lighting Products. His installation includes two 360/40s and two Consolidated Computer Key-Edit systems (one with four stations and one with eight stations).

Throughput Increases Discussed

WINSHIP: I think you [Tierney] said State Street had a standard of about 6,000 strokes per hour per girl and that was on 029s, and 7,800 strokes per hour on key-to-disk. Is that about yours?

LAWTON: No, we greatly increased that. On our keystrokes per hour, we averaged about 8,000 to 8,500. Right now, we're over 10,000.

TIERNEY: On all your girls?

LAWTON: No, this is room average. I take the 32 girls, count their keystrokes for the week, and divide by 40 hours for each girl. Then I average the averages. I have some girls who punch at 14,000 to 15,000 per hour. Other girls, who are new, are only punching 8,000 and 9,000.

BABIN: Would you say the increase over keypunching is due to the fact that most of these key-to-disk systems have the batch balance and operator statistics inherent in them?

LAWTON: No, I think that you actually speed up your keypunching because the girl doesn't have to wait for a card to feed or a card to eject. She doesn't have to worry about duplicating or skipping. If you are skipping from column 10 to column 70 on keypunch, you have to wait. You don't wait any more. It's instantaneous.

And when you duplicate, you only put your DUP in once, then its never put on the disk again. The only time that DUP comes out [on each record] is when you go to tape.

BABIN: True, but it's going to take that girl the same amount of time to depress the key on the 029 as it does on any of the key-to-disk systems. She is still going to punch that same rate.

LAWTON: But she doesn't have to worry about loading cards into her machine, leave the machine to go and get cards. She doesn't have to take cards out of her machine. She doesn't have to look at an error, take the card out, duplicate it to a certain point where she made the error. You've lost all that. It gives her more time for keypunching.

TIERNEY: I think the point Mr. Lawton is trying to make is that with a key-to-magnetic device you can maintain a rhythm. Whereas with a keypunch, although you still may have to depress the same keys, you have to wait, and the operator is constantly interrupting the rhythm.

Testing, Training, Supervision Areas Discussed

(Continued from page 6)

was a little longer than anticipated primarily because of psychological aspects. They could see a computer there, and they weren't quite sure how it was interacting with them. It took longer than we anticipated until they got up to what we expected of them. There was an initial decline.

TIERNEY: As far as parallel, pilot tests go, I will not go along with pilot tests for anything.

I want parallel operation for all conversions. I don't want any piece of equipment sitting on our floor which I am paying for if it is not paying for itself.

I want conversion work done before the machine arrives, and I want it tested before the machine arrives, so that when it does arrive, we are running actual, live production.

Should we have trouble with the parallel testing, we can fall back on keypunching, but at the end of 30 days I want to be [putting out production on] one piece of gear.

LAWTON: We, like Mr. Winship, did underestimate the learning curve. We were told it would take about a week. It took about a week and a half to teach the girls.

We will take some of the blame for this. We did give them a very difficult application. During this learning period, we continued to keypunch cards and got our work out with 12 girls less. We did work overtime for a week and a half. The girls that were training worked overtime in order to get our work done. During that time, we were working on actual, live data. When we keypunched cards, the same documents were put on Key-Logic. When we went card-to-tape, I did a tape-compare of what we had on cards against what we had on tape to find out how we were doing. I did this about three or four times, and when we decided to go, we did not do any parallel operation.

But what we didn't get done on Key-Logic, we had to continue with keypunches, so we had two inputs for about a week and a half. But at the end of the week and a half, we were going all the way with tape.

But we did underestimate the learning curve. That was partially our fault. I won't blame the manufacturer all the way. The training was done by Keyboard Training. They did an excellent job, and I can't speak highly enough for them. They did a very fine job.

NOAH: We had very few problems in the conversion from the point of view of the girls. I think going from keypunch to key-to-tape was a much tougher operation than from key-to-tape to Key-Edit. We had one or two operators who wouldn't try it. But we were going to have to lay off two people anyway.

We did no parallel testing. I don't believe in parallel testing, if I can avoid it. There will be problems that develop from time to time anyway, but they are usually problems you can straighten out pretty quickly.

But for three months we did keep the Mohawks, because if the machine went down, there would be eight people twiddling their thumbs until we got back on the air.

Fortunately I think the most we were down at one time was about an hour. Key-Edit has done a very good job of keeping the equipment up. That was one of the considerations when I bought it. I looked upon Key-Edit very much the same as I looked upon Honeywell when I changed from IBM to Honeywell. And that was if Key-Edit couldn't do a good job for us when they were located in Waltham and we are in Cambridge, well, they might just as well give up.

LAWTON: You just brought up something that I'm quite surprised the nonusers haven't brought up yet. To me that was kind of an important question. What happens when your [key-to-disk] mainframe goes down? You have 16 operators not working. That [problem is] in the mind of the manufacturer as well. I'm sure that Key-Edit or Key-Logic will do their utmost to get you service and get it fast. I know in our case that's the way it's happened. In the last three months I have had 100% uptime.

I did have problems before. Maybe it was a malfunction of the equipment. I don't know, but it was blamed on a power loss. It burned out a main power supply or something like that. It took them an hour to get another one and put it in. Right now I have two extra power supplies in the cabinet so the [service] man can put it in within 5 or 10 minutes. But they do their utmost.

WINSHIP: Another point is that they do – and should – use proven components. Key-Edit has a PDP-8 sitting in the middle, a Vermont Research drum, a PEC tape drive, and Honeywell keyboards. Each one of these components is a proven device. I think it makes a difference.

LAWTON: Yes, it does.

BABIN: Mr. Lawton stated that the nonusers failed to [ask about] backup with key-to-disk equipment. It just slipped my mind momentarily because one time a vendor [offered] two systems for the price of one for a year. This was to get their equipment in to us. If one went down, we'd just hook up to the other one. And at the end of the year, we would have a choice of keeping the two systems and paying full price or sending one system back after we had seen for ourselves the reliability of the equipment.

We are well aware of the limitations of some of these machines. Some vendors tell you, "Oh, don't worry, you can continue to key on the tape and you dump that tape back in." I don't believe that because it's in no order. When you have 16 girls punching onto one tape it makes it kind of tough to get this data back on the disk.

Next week, in the fourth and final part of this series, the users discuss internal control problems, remote entry, and applications.

How Large Is National Debt?

WASHINGTON, D.C. – The U.S. national debt can be expressed by three piles of silver dollars stacked to the moon, according to Sen. Ellender [D-La.].

The size of the debt is so staggering Ellender's staff used a computer to find ways of expressing it. They found it equal to:

- All U.S. Senators counting two $1 bills per second nonstop for 64 years
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A Users Group in a Union?

CW Washington Bureau

WASHINGTON, D.C. – The AFL-CIO is quietly forming a computer users group.

While AFL-CIO officials have indicated that the formation of the group is "strictly internal" and that they would therefore like to get "as little publicity as possible," an organizational meeting attended by about 30 to 40 affiliated union representatives was held at AFL-CIO headquarters here recently.

Study committees were organized to look into such areas as departmental standards and procedures, software standardization and packages, training, the use of the computer in contract bargaining, vendor relations, personnel and the special problems of small unions.

The purpose of the meeting "is to provide a formal means for union computer experts to exchange technical experience, information and programs and to further stress the importance of proper and effective administrative procedures," wrote Secretary-Treasurer Lane Kirkland in a letter notifying affiliated unions of the meeting.

"As the use of computers has grown in the trade union movement so too have problems. Computers have not, unfortunately, solved all of our administrative problems; indeed they have brought about a whole new set of problems of their own."

Insurance Payment Delayed

'Computer Error'...One Dropped Baby

By a CW Staff Writer

DETROIT – A reported "computer error" prevented a medical insurance claim from being paid for nearly a year, but when Michigan Blue Shield officials were questioned about the incident, they reported "no story exists."

The "computer error," it turned out, was simply the failure to manually enter the birth of a new daughter to the file of Miles A. Hurwitz, a local attorney who said he was paying about $800 a year for health insurance.

The daughter was born in November, 1969, and Michigan Blue Shield apparently handled that medical claim. But when Hurwitz brought his daughter to the doctor a year later, Blue Shield told him it had no record of her.

'Look, Stupid'

After about six months of correspondence, Hurwitz got fed up, and wrote "Look, stupid" to Blue Shield officials, who apologized and blamed a "computer error" for the problem.

Blue Shield, and the national Blue Cross organizations, are boasting about their new 22-story office building which houses the latest computer equipment.

Recent publicity has stressed the "importance of reducing the amount of paper needed" from the membership record file.

But all the new sophisticated gear cannot detract from the statement one official made to CW: "No computer error as such existed. Apparently the problem lay in the manual area of updating existing files."

Officials of Michigan Blue Shield said the small claim, has been handled to Hurwitz's satisfaction.

College Gets GE Computer

HASTINGS, Neb. – The Central Nebraska Technical College has been given a GE 225 by the U.S. National Bank of Omaha and the First National Bank of Hastings. The system will be used primarily for instructional purposes.

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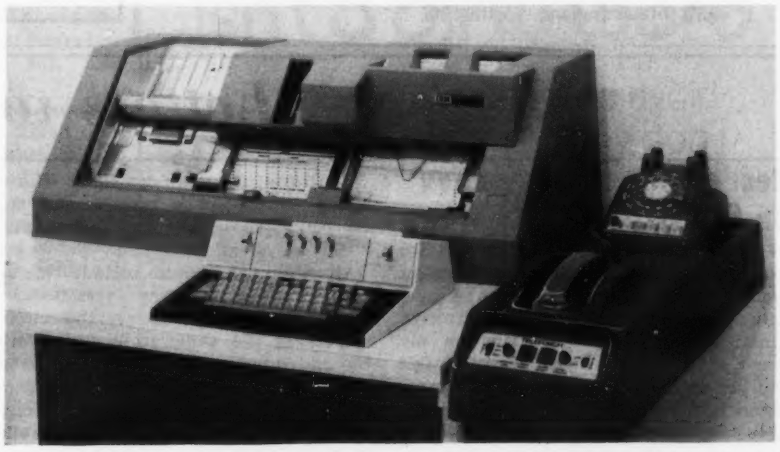

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Editorial

Once Is Enough

During the CW User Forum, participant David Tierney remarked that he didn't believe a source document should ever be rekeyed unless some changes were being made in the data or format.

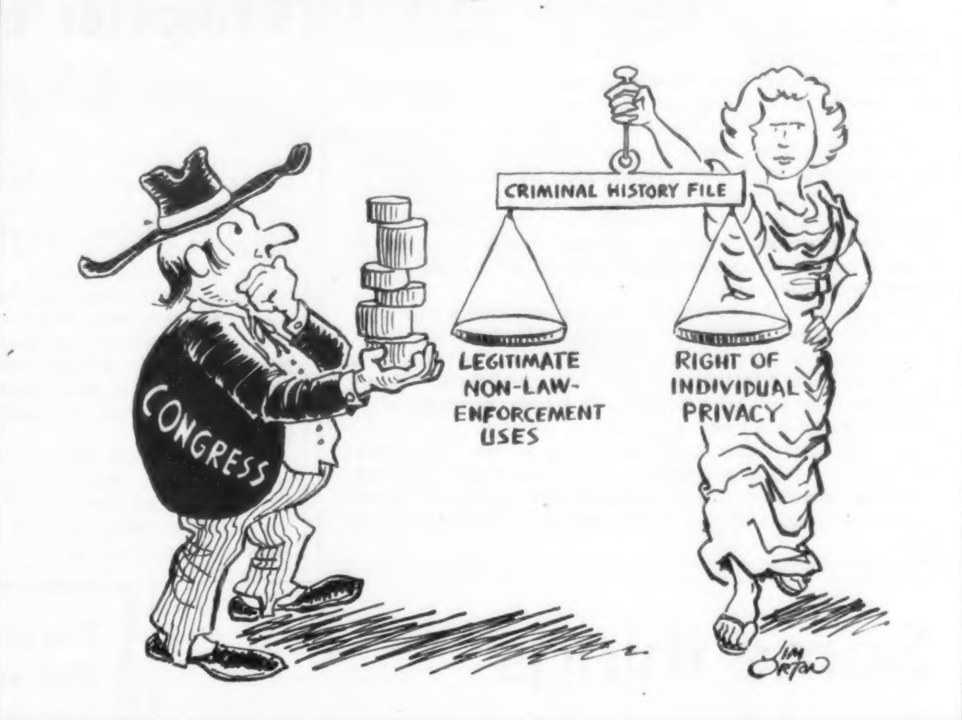
Unforunately, however, unnecessary duplication of source documents is still the rule more than the exception. In all too many applications, the original source document is handwritten. This data is then typewritten and sent to an input preparation department, where it is "prepared" for the third time.

People are rebelling more and more against such mindless jobs as rekeying data. This is reflected in the turnover rate and the error rate.

As some businesses have discovered, a lot of data can be captured at the source through the use of various devices – both desk-sized and portable – that record information in machine-readable form.

Even where a portable unit is required and a satisfactory device isn't available yet, data can easily be translated into machine-readable form during the first typing. And this job should be performed by a clerk who either adds information or also has other duties, to make the work interesting and worthwhile.

Balancing Problem



Letters to the Editor

Reader Needs Information On Systems' Security Flaws

I would like to ask your readers for examples of [security] flaws in computer systems they have experienced. As a graduate student at the University of Pennsylvania, I am currently working on my thesis which will deal with access control and privacy considerations in the computer environment.

My research is prompted by America's growing concern over data banks and their threat to personal privacy. Though no system can ever be made 100% secure, an effective integration of hardware, software, personnel and physical security measures can make illegal access extremely difficult and expensive.

I believe that if present computer weaknesses are brought out into the open (instead of being hidden under "losses – misc." or "secret" labels) we can bring about some much needed change.

The hardest part of my literature search has been finding actual documented instances of weak points in computer systems. Therefore, I am asking people to send me short accounts of their experiences pertaining to problems of access control and privacy.

Of course, this includes those who are trying to protect a system, and more especially, those who have been able to "beat" a system.

All examples should include machine configuration, operating system and its release number or date), the circumstances of the penetration and whether the individual wishes to remain anonymous if his example is used in my paper.

Jeff Bergart
Ford Fellow

Univ. of Penna.
Box B-617
3650 Chestnut St.
Phila., Pa. 19104

DP Industry Unwilling To Hire Disadvantaged

Reference is made to articles by Joseph Hanlon in CW Sept. 17, 24 and Oct. 1, 1969; and finally Sept. 29, 1971. It seems as if Hanlon specializes in reporting inner-city programs which have failed in the field of data processing. Apparently, all the failures call Hanlon.

However, I feel that he has brought up a good point in all his articles: the computer industry is not willing, in the main, to hire the disadvantaged and underemployed.

Usually, computer companies and others are promoting the image of social awareness and responsiveness in their "community relations" but most do not follow through by hiring blacks or other disadvantaged.

This could be accounted for by the Report on the National Advisory Commission on Civil Disorders which states that most employers, 83%, felt that few blacks are now qualified for white collar or professional level jobs. It appears that these employers have already formed an opinion of the disadvantaged even before they show up for the interview.

Herbert Drucker
President

Training for Opportunities
In Programming, Inc.
Adelphi, Md.

Ombudsman Power Depends On His Group's Prestige

As "computer ombudsman" for the Phoenix, Ariz. chapter of ACM, I feel that a few comments are in order regarding The Taylor Report in the Sept. 29 issue.

The article does pose a challenge to the ACM ombudsman program and, as such, is welcome. However, I feel that a few points should be clarified.

I agree that Eccles seems to be "one of the skilled computer people who would be qualified to be an ACM ombudsman." But, the fact is, he is not. As such, he remains one of the growing number of individuals in our society subject to the capricious whims of ineptly designed computer programs.

I believe it is generally true that "skilled computer people . . . can effectively cope with the various blame-the-computer attacks" but only if they represent a group or organization. Their effectiveness generally increases in proportion to the sponsoring organization's prestige.

This assumption underlies the concept of the ACM ombudsman program. Hopefully, the ombudsman will be able to correct the problem before the victim is forced to resort to "opting out."

I do not see the ombudsman's role as being limited to cases where the computer is "unfairly" blamed. Indeed the actions taken by some of the local ACM chapters have been directed primarily toward resolving cases in which the computers (or the computer programs) were at fault.

Oris D. Friesen
Computer Ombudsman

Phoenix, Ariz.

How Does Voter Know He Punched Right Button?

In regard to the front page article Oct. 6, "On-Line Computer Vote" by Edward J. Bride: Yipes! How does the voter know that what he entered on the Touch-Tone pad is what he meant to enter?

Some kind of entry verification is necessary, if not because professional ethics should demand it, then at least because it will help win the voter's confidence in the system. You can tell if your creditor's billing system goofs but how can the individual voter tell his vote got into the Hillsborough County vote counting system correctly?

There must be more to this story. How are transmission errors and illegal entry values handled, for instance. As described, this system would not seem to merit the optimism the director of the county's DP center seems to feel.

If the telephones are equipped to create backup hard copy, can the voter check it against his intentions and change his entry if there was a mistake?

Eliminating paper is a great idea but let's not eliminate our ability to check what we're doing along with it.

Susan H. Lewis
Systems Analyst

Arthur D. Little, Inc.

As mentioned in the story, the software is not complete yet; these are some of the problems being worked on. One answer to the verification question is a voice response unit, the cost of which is also being evaluated. Ed.

User Can Redesign System Through Equipment Choice

In your editorial, "Stand and Be Counted," Sept. 22, you voiced disappointment on the lack of reaction by users groups to the Compata report. I concur in this disappointment.

However, allow me to express my disappointment in your thinking as displayed in this editorial. I am greatly disappointed for two reasons. The first is the opinion expressed that it is the user's responsibility to finance redesign of equipment which usually is only leased.

In my opinion, the user has the power to redesign through his selection of equipment available from various manufacturers. It is the manufacturer's responsibility to design the most efficient equipment possible.

My second disappointment involves what apparently is your acceptance of a marketing ploy. You state that "if you can increase the throughput of a 360 by 100%, you are effectively cutting its price by 50%."

The only time this might be true would be in the very novel situation where a user would actually double his usage by increasing his efficiency by 100%. Since survey after survey shows computer usage is rarely, if ever, 100%, it is my opinion that your editorial did the industry a real disservice.

Ignoring the fact that the true cost of data processing is the dollars paid out each month is typical of the computer industry and has diverted a great deal of thinking from the areas where redesign is actually needed.

Branin A. Boyd, Vice-President
Advanced Systems & Product Planning
Digital Information Devices, Inc.
Lionville, Pa.

A Software Out for Spectra Users

Why Must RCA Users Lose Their System Investments?

The Taylor Report

By

Alan Taylor, CDP

One of the major problems currently involved in assessing the effect of RCA's decision comes in trying to evaluate what the future holds for users of the Spectra systems, and how long the systems can be kept in useful life.

Early comment, particularly from the financial papers such as the *Wall Street Journal*, brought out the general statement that users almost inevitably stood to lose some part of their investment. Just how this would occur was not made clear – it might be through the loss of resale value, or through the lack of really interested maintenance and equipment upgrade facilities.

Apparently, however, the statement was based upon the uselessness of computers without an ongoing software support force, coupled with the careful wording of the RCA statement. RCA said the contractual rights of the user would be honored but said nothing about the necessary software maintenance.

Software Maintenance Needed

And make no doubt about it – currently software maintenance is required. While I am writing this I am waiting for a fix to the latest IBM OS release (so that some programs that are known to work on the 360 can be run on the 370.) At present they are being killed in the Open statement!

And, until we get the fix installed we are dead in the water. Software maintenance currently can make all the difference between a productive computer and a large heap of scrap metal.

Contract Situation Bad

Nor are the contracts involved very good. Software, by tradition in our industry, is supplied to RCA users on a catch-as-catch-can basis. The user is entitled to whatever is going – but is not guaranteed continued availability, or specified productivity etc.

This has not been given too much attention since 1959, when software really started entering the general computer market – because we have not had the collapse of a large computer maker like RCA since then.

Now, however, RCA's users are having to pay for the failure of users as a whole to insist on protecting themselves contractually from software problems.

Technical Help Possible

Luckily, technical assistance is possible, and may well be able to get the Spectra user (or at least some of them) out of his hole. RCA software, like most software, consists of three basic groups – system software, compilers and utilities, and user programs.

The problem lies mainly in the provision of the system software – and this is apparently an insuperable problem, unless RCA decides to guarantee maintaining a good capability for 10 or 15 years more, which certainly has not happened.

IBM Software Works

However, RCA system software is not the only system software that runs on the Spectra systems. IBM system software also does, using a software emulator that exists right now.

So, Spectra users have two supply sources for their software. We are fairly certain that IBM will continue to supply system software for the 360. Nor would the use of IBM system software be particularly awkward for Spectra users.

Most of the user programs, if not all of them, will run under the IBM systems, so the big hurdle involved in most change-overs is not present.

Another helpful feature is that there still is a current RCA system which will be available for quite some time to come, so there is not the urgency often involved in such change-overs.

IBM Software Available

The availability of the IBM software is apparently no problem. There are two types of software that IBM 360 users have – the System Control Programs, including the operating systems etc. and the Program Products.

IBM supplies the System Control Programs at the cost of reproduction and distribution, and its spokesmen tell me Program Products will be licensed to RCA users – or to any other people for that matter.

Currently there are already a number of RCA installations using the IBM software, and no supply problems have occurred.

The position of fixing or even locating possible bugs in the software is something else again, but the signs are that this will also be able to be overcome so that the use of IBM software does become a realistic way to use the Spectra computers.

Users Need Not Lose

With IBM software available to make RCA hardware continue in productive operation, the question arises as to whether there really need be any loss of the user's investment.

Despite the financial experts' opinions, I don't think it is really necessary for users to lose anything, and if they act properly I don't think they will.

The 360 Emulator on Spectras

The 360 Emulator, also called 360 Mode of Operation, is a package which occupies between 16K and 20K, and which converts the physical I/O commands issued by the IBM operating systems into Spectra commands. Degradation therefore occurs depending upon the density of issuing physical I/O commands.

The general maximum degradation occurs with the heavily disk-bound operations, and can amount to 20%. Compute bound operations work at the full speed of the Spectra system concerned.

Both DOS and OS MFT can be handled fully. OS MVT is not currently fully operational.

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Societies/ User Groups

Standards, Professionalism

Familiar Calls Issued to Users

By Edward J. Bride
Of the CW Staff

NEW YORK – Two prime user issues, software standards and professionalism, were featured topics in many discussion periods during the fall meeting of the Honeywell Users Group (HUG) here.

Although most sessions were devoted to problems particular to the large Honeywell systems users, the more widespread difficulty of software standards was hardly ignored.

Some Honeywell technicians, in fact, were on hand to try to explain the levels of ANS Cobol.

One user said the multiplicity of the "levels of standards" causes transition problems even in an upgrade within one manufacturer's line, not simply when changing vendors.

On and off the record, speakers and paid attendees were calling for a more professional outlook when developing systems. One speaker cautioned against the spread of "purposeless technology."

While most speakers were addressing the audience under "privileged" conditions and did not wish to be quoted on these ideas, outgoing HUG President Frank A. Domingo said he agreed with the principle of considering the ultimate effects of systems on individuals. Cost is not the only justification for technological advances, he concurred.

Some speakers addressed the privacy issue, and one observed all people in the data processing profession will be involved in the emotional crossfire of the government's need to know certain items *vs.* an individual's right to privacy. While politicians sometimes blow this issue out of proportion, one speaker said he tends "not to get too concerned, because I've never seen anybody keep a data bank up to date, over a long period of time."

He did not elaborate whether this deficiency would spell doom for the FBI's various computer data bank projects, but did say technicians developing such systems should "increasingly look" at what they are doing, and why.

Effect on Public

Domingo agreed with this call for professionalism, noting it is the effect computers have on the public, not on DP departments, which is the important factor in designing applications.

The meeting drew just under 100 paid participants, some of whom were reportedly branch managers invited by customers. The other Honeywell participants were technicians invited to assist the users, Domingo noted.

Although previous meetings have drawn more attendees from the user ranks, Domingo stated the economy kept some away. Last spring's meeting in Denver was more convenient for West Coast attendees, he added, noting there is no saturation of large Honeywell systems on the East Coast.

The various Honeywell and old GE user groups are not expected to merge like the manufacturers, according to some attendees, mostly because the hardware and systems software is still not compatible.

When equipment has "merged," then the groups will merge, one attendee stated.

Domingo said Honeywell could not predict when a common hardware line would be developed, but he did say he thought operating systems compatibility would precede hardware commonality.

Museum History Study Aided by Afips Grant

WASHINGTON, D.C. – The Smithsonian Institution has been granted $30,000 in support of its long-term Computer History Project, being carried out with the American Federation of Information Processing Societies (Afips).

The grant, for Fiscal year 1972, was authorized by the Afips Board of Directors, and will enable the museum to continue the project which was begun in 1967.

The overall objective of the program is to build a repository of material covering the birth and evolution of computing, Afips said.

Materials comprise taped interviews with pioneers, written material including working papers and unpublished reports, bibliographic materials and other "significant artifacts."

Random Notes

Scoop Cuts DOS/360 Run Times 33% on Some Jobs

HUNTINGTON, Conn. – DOS/360 users may be able to cut throughput time by 33% on some job mixes by using the Simultaneous Capture Of Output Processing (Scoop) spooling package from Aids Associates Inc.

Scoop can be used for either printed or punched output, or both, and can be adapted for use with one, two or three partitions. It gets the output device operating at close to rated speed without delaying the application program. Scoop uses from 632 to 1,048 bytes of core, and can be purchased for $3,250 from Aids at 30 Huntington St., 06484.

Electroencephalograms Analyzed By T/S Program in Philadelphia

PHILADELPHIA – Doctors at local hospitals have been able to gain rapid interpretations and formal diagnoses of electroencephalograms (EEG), through a time-shared program recently installed on the Interax Inc. service.

The program uses as input a technician's coded statements of the presence or absence of cirtical wave form parameters. It then prints an analysis of the test, with interpretation based on stored data. Before the diganosis is forwarded to the sending hospital, however, it is reviewed along with the actual EEG tracings by a member of Interax's Advisory Board.

New On-Line Systems Division Offers On-Site User Support

PITTSBURGH, Pa. – On-Line Systems Inc., until now a time-sharing vendor, has expanded to include a Professional Services Division that will provide on-site systems engineering support for users.

The division is expected to analyze user information requirements and identify present and future DP opportunities. OLS personnel will also aid in developing graphic and conventional applications for use on either user in-house equipment or the OLS network.

OLS also plans to offer formal instruction in programming languages, computer-aided engineering design and application of on-line concepts.

OLS is at 4721 McKnight Road, 15237.

UCC Puts 'Minidata' on Uninet

KANSAS CITY, Mo. – United Computing Systems now provides a new conversational information retrieval system, called Minidata, on its Uninet time-sharing network. Minidata is said to maintain and retrieve data from data bases of up to 500,000 characters.

The data files used with Minidata are compatible with Basic, Cobol or Fortran files, so application programs could be written in any of those languages.

Canberra Has Op Sys For Novas

MERIDEN, Conn. – Canberra Industries has developed an operating system that allows its recently announced Model 2020 cassette tape transport system to be used with Data General Nova/Supernova minis.

The Model 2020 and the software sell for a bundled price of $6,900. Deliveries will begin in December from 45 Gracey Ave., 06450.

For 360 –370 Users

Order IV Handles Inventory in 256K

By Don Leavitt
Of the CW Staff

CANOGA PARK, Calif. – An on-line order processing and inventory control system for manufacturers or distributors, Order IV from Informatics is designed for IBM 360s or 370s with 256K bytes of memory.

The system is able to support a wide variety of fixed and portable terminals at low or high communications speeds, an Informatics spokesman said. With the terminals, the user can specify his reporting requirements, system loading capabilities and desired response time for inquiries. Pricing algorithms, order point and order quantity algorithms can also be entered from remote stations.

Operates On-Line

By operating on-line, Order IV users receive sales reports faster than they would in a batch system. This enables them to spot distribution, inventory and production problems earlier than before and to get inventory on current status at all times, the spokesman said.

The system includes editing routines that return unacceptable orders and/or inquiries to their sources for correction and re-entry.

Order IV permits credit checks against accepted entries so that a credit manager may cancel, clear or delay the order via his terminal. Otherwise, the system selects the appropriate fulfilling location and allocates inventory at that location.

For out-of-inventory situations, the system will select an alternate fulfilling site or shift the request to an automatic back ordering routine.

'News' at Start-up

Each day sales analyses, commission quota reports and current "news dispatches" are sent to order entry terminals and inventory locations as part of Order IV start-up. Later, at system shutdown, data is accumulated for sales, shipment and accounts receivable systems.

Complete inventory management, customer analysis and accounts receivable reports are generated by Order IV according to user-defined formats and schedules, to support the on-line order and inquiry capabilities.

Order IV is a modular system tailored to the user's requirements. The package cost will range from $100,000 to $500,000 depending on the size and amount of customization required.

Informatics Inc. is at 21050 Vanowen St., 91303.

Datanetics System Runs SEL 810 Assemblies on IBM 1130s, 1800s

PITTSBURGH, Pa. – Selembler/1130, from Datanetics, is a series of programs which allow Systems Engineering Laboratories (SEL) 810 A/B minicomputer users to assemble and generate absolute object paper tapes of SEL Mnembler language programs on an IBM 1130 or 1800.

The Datanetics package accepts as input all SEL mnemonic instructions and pseudo-op codes, as described in the SEL 810 reference manual.

Selembler/1130 includes grammar and syntax checking capabilities comparable to those available on the SEL minis.

Programs can be assembled individually or in batched mode. Selembler/1130 output includes an assembly listing almost identical to that produced by Mnembler. It also includes an alphabetized symbol table and a cross-reference list of variables.

A separate relocatable punched card object deck is generated for each program or subprogram. Any combination of these relocatable object decks can be loaded together on the 1130 or 1800 to generate a core load in absolute format on punched paper tape ready for use on the SEL 810.

Selembler/1130 includes an absolute loader for use on the 810 and this routine is said to take only half the core of the SEL-provided loader.

There is a one-time lease charge for Selembler/1130 of $2,995, which covers object programs, manuals and a year's maintenance.

Datanetics is at 3512 Fifth Avenue.

Honeywell Adds Batch OS to Minis

WALTHAM, Mass. – An operating system that allows users of Honeywell's Series 16 real-time minicomputer systems to develop and run programs in a batch-processing mode has been introduced by Honeywell Information Systems.

BOS is a disk-oriented job-processing system that supplements the real-time, communications, and data acquisition and control capabilities currently available on Series 16 systems.

BOS allows application programs to be selectively compiled, loaded, debugged and executed on Model 316 and 516 systems.

The operating system, provides many of the capabilities found on larger batch-oriented CPUs, according to Honeywell. Features of BOS include a device-independent I/O system, a production-oriented job control language, a sequential disk file system and a large complement of system error messages.

The permanent memory-resident portion of BOS is 512 words long, but minimum hardware required is any Model 316 or 516 central processor with 12K words of main memory, a moving-head or fixed-head disk drive, paper tape reader, punch and console typewriter. BOS also supports 7-track magnetic tape drives.

The batch operating system is available immediately at no cost to current users of Honeywell Series 16 systems.

TLM Adds Sort/Merge Package For PDP-11 Business Usage

WAKEFIELD, Mass. – With the announced availability of a Sort/Merge package from TLM Systems Associates, DEC PDP-11 users can now install business applications on their equipment.

The sort phase of the TLM Sort/Merge utilizes a selection-replacement technique to create maximum length strings for the merge phase. The sort can be performed in ascending or descending sequence on Ascii or binary key fields.

The package is capable of handling linked file records of up to 255, 16-bit words, or 510 bytes. Contiguous file structures cannot be processed, TLM said.

I/O files may be on either disk or tape, and intermediate storage may also be on either medium, but it must not be mixed.

TLM's Sort/Merge is available for $800, including object and load modules, and a user's manual.

TLM Systems Associates is in the Surety Bank Bldg., Two Smith St., 01880.

Data Base System Runs on 1100s

HOUSTON, Texas – System 2000, a data base management system that can interface with Cobol or Fortran application programs, is now available from MRI Systems Corp. for use on Univac 1100 CPUs operating under Exec 8.

Since it is modular, the system may range in cost from $25,000 to more than $100,000. A typical System 2000 would cost $60,000.

MRI's mailing address is P.O. Box 9510, 78757.

System Handles Student Accounting, Govt. Funding Reports for Schools

SAN JOSE, Calif. – An information system capable of reporting enrollment, attendance, grade and course credit data is being developed for the local school district by Alton Associates Corp. of Sunnyvale, Calif.

The system will process information on 30,000 students who take part each semester in San Jose's Metropolitan Adult Education Program (Maep).

The Alton system is expected to compare enrollment and attendance figures so that courses not holding student interest can be identified. The attendance figures also can be used to justify granting or withholding course credit for a student whose attendance is erratic.

A contract with Alton covers a variety of DP services, including construction of a comprehensive, program-wide data base which will serve nearly all educational accounting functions.

Built from modules customized by Alton, the system will process registrations for the 1,400 classes offered each term in facilities provided by six cooperating school districts in the San Jose area. Class admission cards for the students and enrollment listings for the instructors will be printed.

Surveys on vocational education courses and the annual report of the entire Maep operation will be among other reports generated by the system. All California and federal supplementary funding report requirements will be met, Alton said.

The company already has developed much of the general logic needed for the system but has to tailor some of its software to meet conditions peculiar to Maep. The system will run on a Burrough's B3500 in Alton's computer center at 505 W. Olive Ave., in Sunnyvale.

Bankserv Adds Savings Package

CHERRY HILL, N.J. – IBM 360-based banking installations operating in multibank or multibranch environments are able to handle virtually all forms of time deposit accounts, with the Bankserv Savings Accounting System available from Arthur S. Kranzley and Co., Inc. (ASK).

The system was developed by Zions First National Bank, Salt Lake City, Utah, and is described as both modular and integrated. It will handle certificates of deposit, "golden" and regular passbook savings, as well as Christmas Club accounting. Automatic transfers from checking accounts and "check-a-month" savings plans can also be accommodated.

Modules are available to accept Micr, punched card or magnetic tape input. Editing and processing routines can handle up to 20 different savings instruments.

Written in ANS Cobol for use on a 65K IBM 360 operating under DOS, the savings system "should prove adaptable" to other CPUs.

Cost of an average system is "about $20,000."

Arthur S. Kranzley Co. is at 1010 South Kings Highway, 08034.

Bits and Pieces

Memorex Speeds Up 1240 To 120 Char./Sec Printing

SANTA CLARA, Calif. – Memorex has modified the 1240 communications terminal to operate at 120 char./sec. The higher speed is achieved in part by a reduction in the character set to 48 down from 94 characters, a Memorex spokesman said.

The higher speed will be available in the second quarter of 1972 at an added cost of $15/mo. The higher speed will initially be available only on new units. Memorex is located at San Tomas and Central Expressway, 95052.

Univac Expands Print, Tape Systems to 9000 Series

PHILADELPHIA – Univac has adapted the 0768-02 printer for use with the 9200, 9300, and 9400 systems.

First announced with the Univac 1110 last year, the printer can operate at a top speed of 2,000 line/min in all-numeric mode. The 0768-02 can handle an 87 character set at 1,000 line/min for "everyday applications" Univac said. For full upper and lower case capability, the printer can use one of three character sets compatible with other Univac printers and the 2703 OCR reader.

Prices are $1,425/mo with maintenance or $46,545 purchase price.

Univac also said the Uniservo 12 magnetic tape system is now available for all 9200 and 9300 CPUs with selector channels. The system has a speed of 42.7 in./sec with data transfer up to 68,320 frames/sec, A master unit capable of handling up to three drives costs $20,015 or $560/mo. Individual drives cost $340/mo or $11,745.

Control Data Adds 1714 System

MINNEAPOLIS, Minn. – CDC has expanded its 1700 series with the model 1714 system. The new system contains maximum random access memory of 64K eighteen-bit words, twice that available with SC 1700 and 1704 models.

A typical CDC 1714 system with 48K words of core memory and two optional 16-bit direct storage access address channels can be leased for $3,977 per month (1-year lease, with maintenance) and purchased for $129,060. The CDC 1714 with standard software will be available early in 1972.

Uses MOS, Bipolar, and Core

DEC Announces Top-of-Line PDP-11/45

By Michael Merritt
Of the CW Staff

MAYNARD, Mass. – A wave of powerful new minis seems to be breaking. Two months ago Interdata announced its fast Model 80. Last week Univac unveiled its 1616 with 60 general registers and flexible instruction formats. And now DEC has lifted the wraps from its top-of-the-line PDP-11/45.

Like the Interdata machine, the 11/45 uses Schottky clamped TTL logic for fast operation. Interregister instruction execution time is 300 nsec. Users have a choice of bipolar, MOS, or core memory, or a combination of the three, up to 124K 16-bit words.

Bipolar memory cycle time is 300 nsec, while the MOS operates at 450 nsec. The core has a cycle time of 850 nsec. MOS and core memory may be interleaved.

Extended arithmetic is standard on the 11/45, as are an expanded instruction set, stack overflow protection, and overlapped instructions. Floating point and segmentation hardware is optional.

Two Data Buses

The 11/45 has two universal data buses which allow overlapping of I/O, computation, and direct memory access. There are two software monitors for the machine, a disk operating system, and RSTS, a real-time time-sharing system with an extended version of Basic and Basic-Plus.

All PDP-11 peripherals can be used on the system.

The computer is also software compatible with the rest of the PDP-11 line.

Up to 8K of bipolar and 32K of MOS memory can be used. The second data bus that connects the dual-port semiconductor memory system can handle external data requests up to 40 Mbit/sec, while the first is free to handle internal processing and machine I/O.

The instruction set, which includes integer multiply and divide, can handle bits, bytes, words, and multiple words. Options include byte parity and power retention systems.

DEC said the PDP-11/45 allows communications systems to handle data throughput rates and larger numbers of lines than other computers in its price range. Hardware and software priority interrupt scheduling, memory segmentation, and multiprogramming are all powerful features. Price of the PDP-11/45 with 4K of core and a TTY is $16,450. A spokesman said DEC has not yet established firm prices for the rest of the system. Delivery is expected next spring.

Bunker Ramo System 7 Provides Broad View of Stock Condition

TRUMBULL, Conn. – Bunker Ramo has introduced a computer-based stock market data system "designed to improve investment decisions rather than just provide quotation data."

The heart of the system, to be available in the second quarter of 1972, is a new terminal which can display three different types of market data on a horizontally-split CRT screen. A smaller single quote terminal and a 30 char./sec printer will also be available.

The System 7 will essentially combine Bunker Ramo's existing quotation and other stock services and add computer data to give security analysts an overall picture of a specific stock. Unlike the recently announced IBM 3670 system which requires brokers to maintain an in-house data bank, System 7 will give Wall Street users access to off-site data banks. This relieves the broker of maintaining large data bases, Bunker Ramo said.

However, phase II of the System 7 will allow users to combine their in-house data with information provided by Bunker Ramo quotation services. As an alternative, complete back-office capabilities may be added later to relieve users of these functions, the firm said.

Among the services to be combined for subscribers of System 7 are statistical data, commodity data, exchange data, and Nasdaq information. In addition, stock tickers and newswires can also be accessed by the System 7 terminal user.

Cassettes Tie to RS-232 Devices

SUNNYVALE, Calif. – A stand-alone cassette tape system that can interface with any EIA RS-232 type device has been introduced by Dicom Industries Inc.

The 345 system includes three transports in a typical configuration for either off- or on-line use. In polling applications, the 345 system can accept Ascii commands through the keyboard of a TTY or similar terminal.

Used in conjunction with a teletypewriter the 345 becomes a key-to-tape system with data capture and playback capabilities without using data lines or CPU time.

After data is prepared, it can be transmitted to a CPU using an automatic answer modem. If more than one transport is used, processed data can be sent back from the CPU for later off-line read out on a CRT or printer.

A three-transport system would use one for data entry, a second for operating software to be loaded into a CPU, and a third for accepting transmitted data. In this configuration data is prepared via the TTY or other terminal keyboard and updated from a central site. Files can then be accessed without continuous direct inquiries to the CPU.

The complete system, available now, without TTY costs $4,050 or about $165/mo on a three-year lease. Maintenance by Sirvess is included. The firm is at 715 N. Pastoria Ave., 94086.

CPU Handles 100s of Bit Streams

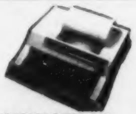
AKRON, Ohio – The Staran associative array processor, originally designed for military use, has been introduced for commercial users by Goodyear Aerospace Corp.

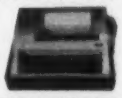
Using an in-house developed software called the Associative Processor Programming Language (Apple), the Staran performs similar operations simultaneously on hundreds of bit streams. The Apple software provides "for full content addressing rather than location addressing," the firm said.

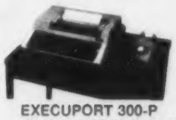
The system has 256 processing elements per array for a total of 15.8M instructions/sec. Up to 32 arrays or 500M instructions/sec can be handled by the system.

The associative array system can be used in applications where high I/O processing is combined with high speed searches, such as MIS file management operations.

The first Staran user is the Federal Aviation Administration which is using the system to demonstrate aircraft collision prediction and avoidance. Commercial deliveries of the Staran will begin next March, and the solid-state CPU will cost "from one to four million dollars," depending on configuration. Goodyear Aerospace is at 1210 Massilon Rd., 44315.







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'Dain' Selects Best Phone Line

By Ronald A. Frank
Of the CW Staff

MADISON, Wis. – A phone company service here is helping state and university CPUs find the most economic line to transmit data to remote sites.

Called Dial Access Intercity Network (DAIN), the service automatically selects the best available line when accessed by a CPU. The system works only with intrastate calls.

DAIN is most suited for large users since it operates with Centrex dialing systems. But the principle of having a CPU select the best type of phone line for a call will undoubtedly increase as data users install more communications processors.

Although the Dain service has been described as using a minicomputer to switch outgoing calls, a Wisconsin Bell spokesman said the line selection is actually controlled by special switching equipment added to the central office in Madison. The important point is that a mini could also do the work, he said.

Dain is presently operating at both Wisconsin University and the state's government agencies. The entire system located in Madison controls outgoing calls from 14,000 phones that have to access a variety of different phone lines. Some of these lines are used for data.

One of the state agencies operating with Dain is the Department of Transportation. Using a 360/65 equipped with automatic calling units, the daprtment regularly polls remote sites for engineering data on highway construction. Other state departments also have their computer data routed by Dain.

When the CPU activates the automatic dial unit, the called number is recorded and Dain takes over.

On intrastate calls, Dain first "looks" at the foreign exchange lines to see if any are available. If all lines are busy, Dain next checks the intrastate Wats lines. If none of these low-cost services are available, Dain sounds a four-second tone, warning the caller that it will next set up a normal dial-up toll call.

Although the CPU cannot detect the Dain tone at present such a feature could be included with additional equipment.

Dain is still unique, according to AT&T. It was designed for a special large state government phone system. But the principles could be adapted for data users and others.

COMPUTERWORLD communications

Naruc Plans Court Plea

WASHINGTON, D.C. – A petition to reconsider the specialized common carrier ruling has been rejected by the Federal Communications Commission. The sponsors plan to appeal in the courts within 60 days.

Initiated by the National Association of Regulatory Commissioners (Naruc) the petition challenged the FCC findings that "the public interest would be served" by entry of the specialized common carriers such as MCI and Datran.

Naruc charged that the entry of the new carriers would divert revenues from existing interstate carriers and result in higher rates for local telephone users. The FCC said Naruc offered no support for this claim.

"Unless it can be proven that the existing carriers are not meeting current demands for service, they should not be forced into competition with the new carriers," the Naruc spokesman said. The FCC in refusing to consider the Naruc petition, said the arguments were "essentially repetitive."

Data Briefs

AT&T Tells FCC It Will Eliminate Telpak Sharing

WASHINGTON, D.C. – AT&T has told the FCC that it proposes to eliminate the sharing provisions of its Telpak private line tariff [CW, Sept. 29], effective December 12.

AT&T said the change would not affect rates, "but it will result in . . . increased charges to some customers."

It was not clear whether present users of the shared facilities would object. But the move is expected to force sharing users to look at private networks and the upcoming specialized carriers.

Sanders Has 2,400 bit/sec Modem for Bell 201B Users

NASHUA, N.H. – Sanders Associates has announced a 2,400 bit/sec modem for synchronous data applications.

Called the Series 24S, the modem is available in a variety of options and is compatible with Bell 201B data sets. Full duplex and half duplex capabilities are available.

Prices range from $1,210 to $1,420 with delivery in 45 days. Sanders is at Daniel Webster Highway South, 03060.

Potential Cost Savings Overshadow Bell Choice

GREENWICH, Conn. – A longstanding dependence on the Bell System is keeping many data users from shifting to non-carrier equipment.

This view is documented in a special report on data interconnection issued by the Interconnection Publishing Co. The report lists advantages and disadvantages that should be considered by data users planning to use independent equipment.

The risks in choosing non-Bell equipment are often overshadowed by the potential cost savings, the report said. It discusses DAAs, acoustic couplers, multiplexers, and front-end processors as they apply to data users. The report costs $25 from the company at 34 W. Putnam Ave., 06830.

WU Adds Modems to 33s

MAHWAH, N.J. – Western Union Data Services Co. has included integrated modems in the Model 33 Teletypes it provides to users.

The terminal with modem "is designed to interface with various AT&T DAAs" and is available in ASR and KSR models at prices ranging from $52/mo to $75/mo.

WU Data Services is at 16 McKee Drive, 07430.

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One phone call did it!

At 3:15 pm on Tuesday Laird Ridings knew little about the mini-computer market.

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Every day more executives are discovering the *new* way to become instant experts on various specific industries, products, markets, companies, and foreign countries as their business situations demand. Situations like:

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- ☐ Studying acquisition opportunities
- ☐ Evaluating investment portfolios
- ☐ Building custom sales presentations
- ☐ Investigating plant expansion plans
- ☐ Training new personnel
- ☐ Preparing reports for management

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Boston DP Group Expands

Education

BOSTON – Last year six local colleges – Babson, Bentley, Regis, Simmons, Curry, and Boston College, and Milton Academy, organized the Academic Computer Group (Accomp), a time-sharing consortium, to provide students with more computing power than they could practically have if the schools worked independently.

Accomp has three new members this fall – Dean Junior College, Suffolk University and Perkins School for the Blind.

Consortia have been organized elsewhere for similar purposes, but Accomp – based at Babson's computer center in Wellesley – may be unique because it operates exclusively on the shares paid by the member schools. Other groups have often had foundation grants or government aid, a Babson spokesman explained.

Babson's computer center is open for business 75 hours a week. But even that may not be enough.

More than 27 courses in management and liberal arts now require students to write computer programs, conduct independent research projects, and use a variety of simulations packages.

New areas of the curriculum – systems analysis and leadership development – will soon be making use of the computer.

It was not until 1967 that the school introduced its first computer course. In the spring of 1968, Babson decided to use remote teletypewriter terminals connected to off-campus time-sharing vendors.

These were installed in the fall of '68.

Babson used several commercial time-sharing vendors during the 1969-70 year. By the end of January there were 18 courses requiring computer use.

In the winter of 1970, Babson, the other colleges and Milton joined forces to form Accomp.

Accomp apparently has done the job it set out to do. Last year, Babson was able to provide all the computing requested and could have increased its activity 300% without extra cost, according to estimates from the college.

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computer industry

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CI Notes

ASI Drops Fujitsu Line

NEW YORK – Fujitsu's attempt to become the first Japanese mainframe maker to gain a foothold in the U.S. apparently has failed as the firm's U.S. distributor, Automation Sciences Inc., announced last week that it would stop distribution.

ASI said it had failed to get a long-term distributorship arrangement with Fujitsu and noted it was "studying the possibility of legal action" against the Japanese company.

ASI spent $1.2 million in marketing the system and received letters of intent for more than $90 million worth of equipment with formal orders from AT&T and Western Union among others, ASI said.

RCA Still in Special Systems

WASHINGTON, D.C. – RCA emphasized it will continue to pursue the specialized government computer market with the recent announcement of a $587,000 Nasa contract.

Under the pact the firm will develop a test model of a space computer that would be 100 times smaller than equivalent commercial systems, weighing 10 pounds. The Spaceborne Ultrareliable Modular Computer would be placed into service between 1975 and 1980. It would be entirely contained on 15 LSI arrays, each with up to 600 electronic elements.

Supershorts

The first production model master computer for the Air Force's short range attack missile (Sram) program has been completed and delivered four weeks ahead of schedule by North American Rockwell's Autonetics Division.

– – –

The Georgia Tech Research Institute in Atlanta is undertaking a study of point-of-sale terminal technology.

– – –

Randolph Computer Corp. has agreed to purchase up to $15 million worth of Computer Consoles, Inc. equipment over a three-year period.

– – –

ICC Leasing Corp., a financial service of ITT, has agreed to finance the leases of Fabri-Tek end-user memory products to Fabri-Tek customers.

– – –

Digital Equipment Corp. has produced its first Irish-built mini, a PDP-11, three months after locating in a factory on the Industrial Park at Galway.

– – –

Sycor, Inc. has started volume shipments of its Models 401 and 402 Key-Cassette terminals to Mitsui & Co., Ltd. of Tokyo.

– – –

Efficient Leasing Corp. has changed its name to Alanthus Corp. as the result of a merger into a wholly owned subsidiary.

– – –

Pertec Peripheral Equipment, a division of Pertec Corp., has moved its disk drive manufacturing subsidiary from Phoenix, to its 72,000-sq-ft facility in Chatsworth, Calif.

– – –

Unitech, Inc., has a record backlog of orders of over $1.1 million.

Presidental Candidate Speaks

Computer Industry Hit as Monopolistic

By E. Drake Lundell Jr.
CW Computer Industry Editor

WASHINGTON, D.C. – The computer industry was singled out as one of the five major monopolistic businesses in the country by Senator Fred R. Harris (D-Okla.) in a Senate speech recently.

Harris, a declared candidate for the Democratic nomination for the presidency, said he would make the issue of monopolistic industries the cornerstone of his campaign.

In a speech on the Senate floor in support of his Concentrated Industries Act, Harris said there were 21 major industry groups in which the top four companies control more than 70% of the business in those fields.

Five groups in particular – computers, steel, automobiles, drugs and telephone equipment – cost the consumer $6 billion per year in "unnecessary monopoly costs," the senator said.

Harris called for the breakup of most of the nation's major corporations as the only way to prevent permanent wage and price guidelines. The breakup of the monopolistic industries would lower consumer prices by as much as 20%, he said.

'Old Remedies Don't Work'

"The old remedies to control inflation don't work any more," Harris said. "And they won't work until we cut down the power of the big corporations to raise prices without regard to market pressures," he added.

Harris said his anti-monopoly legislation would affect about 33% of all manufacturing companies in the nation.

"Shared monopolies," those in which four or fewer companies control 70% of the business, cost the American consumer between $50 billion and $60 billion a year in unnecessary costs, he claimed.

"You can't be for the free enterprise system and not be for breaking up monopolies," he said.

His bill to accomplish this purpose would limit the market share for any firm in a shared monopoly industry to 12% of the total sales of that industry. It would, however, allow companies that can prove economy of scale reduces consumer prices to continue to have a larger market share.

Harris asserted that the movement toward shared monopolies also retarded technological innovation in this country and noted that of the 13 major inventions in the steel industry between 1940 and 1955 none came from research by large steel corporations.

The bill would have a direct bearing on the computer industry since most industry estimates indicate IBM controls about 70% of the business. IBM said it would have "no comment" on the Harris' charges.

The bill takes on added significance since RCA dropped out of the business blaming its failure to survive on "entrenched competition" an oblique reference to the IBM position in the industry.

In addition, the Computer Peripherals Manufacturers Association has been lobbying heavily for the past several years to try to get Congress and the Justice Department to take a closer look at the industry and IBM's dominance of the industry.

The Justice Department is also pursuing an antitrust action against the computer industry leader, and the attention focused on the problem by Harris' presidential candidacy, could cause that agency to press its suit with more vigor than has been evidenced in the past.

"Now is the time for the Congress to challenge the myth that big is always best, that what's good" for large corporations "is good for the American people," Harris affirmed.

Traveling Trade Shows Planned For Nine City, Ten Week Tour

NEWTON, Mass. – A new traveling computer conference and exhibition aimed at regional users is being sponsored by Computerworld Inc., publishers of *Computerworld.*

The Computer Users' Forum and Exhibition will cover nine major cities in 10 weeks and is expected to draw at least 25,000 users during the course of the trip.

"Computerworld has organized an end-user oriented, traveling forum and exhibition to combine the advantages of regional shows – where effective selling can take place – with the advantages of national shows where exposure is a criterion," according to Patrick J. McGovern, publisher.

"We propose to do this by partitioning the national audience into nine regions and providing this exhibition to cover them in series," McGovern said.

"Exhibitors will no longer have all the logistics headaches of the past because the show management will provide all of the exhibit services," he added.

The exhibition, available at one packaged price, will begin its journey Feb. 22 in Boston and include, in order, New York, Washington, D.C., Atlanta, Dallas, Los Angeles, San Francisco, Chicago and Detroit.

User Forums

A user forum will be held each of the three days that the show is in a town and "will stress practical applications and improvements in EDP operations rather than state-of-the-art developments," McGovern said.

Both business and scientific applications will be discussed, with most of the speakers coming from the individual region, he added. A conference luncheon with a nationally known speaker is planned for each city, he added.

All booths will be standardized to prevent the "circus" atmosphere that prevails at some of the larger trade shows, according to Neal Wilder, CW vice-president, sales.

Each exhibitor will ship his computer and sales brochures to Boston before the first show. At the end of the 10 week period the exhibitor will pay to have his equipment shipped back to his plant or directly to the Spring Joint Computer Conference, which will follow closely on the heels of the traveling show.

Booths can be manned by the firm's sales representatives in each city. The exhibit management will be in charge of all shipping and handling of booths between cities.

The package price for the nine city tour for one 10 ft by 8 ft booth will be $9,000, which equals $1,000 per city, Wilder said. Each additional 10 ft by 8 ft booth will be priced at $6,000, he noted. Additional information may be obtained from any CW sales representative.

RCA Write-Off of Computer Unit Leads to 'Largest' Loss Ever

NEW YORK – RCA has decided to write off the entire $250 million cost of getting out of the computer business in its third quarter, resulting in a loss of $231.1 million for the quarter.

RCA's extraordinary charge of $490 million (reduced by an estimated tax recovery of $240 million) in the quarter is thought to be the largest write-off taken by a corporation in one period and the net loss is also considered to be one of the largest ever.

RCA Chairman Robert W. Sarnoff said the firm has held preliminary discussions "with a number of firms concerning the possible sale of all or parts" of the discontinued computer operation. The discussions, he said, are "continuing" but would not elaborate.

The $231.1 million loss in the third period gave the firm a $187.8 million loss for the first nine months of the year.

In reporting the third quarter figures, RCA said the computer operation had a net loss of $9.6 million in the quarter on revenues of $60 million, compared with a net loss of $4.7 million for the computer operation in the comparable year-earlier period.

For the nine months the loss from the computer business amounted to $34.5 million on revenues of $182 million, compared with a loss of $12 million a year earlier.

Aside from the computer section of the business, the company appears to be doing well. In the quarter, net noncomputer income rose 52% to $28.5 million, 36 cents per share, on sales of $871.5 million compared with $18.7 million, 23 cents per share, on revenues of $817.9 million in the third quarter a year ago.

For the nine month period, earnings from continuing operations were $96.7 million, $1.24 per share, on record sales of $2.56 billion, up from the $63.4 million, 80 cents per share, registered on sales of $2.39 billion in the same nine months a year earlier.

RCA Lays Off 1,100 More

MARLBORO, Mass.–RCA Friday laid off about 1,100 more employees, including 660 from field marketing and support in the U.S. and abroad.

Together with the 250 laid off the week before, the latest layoff brings RCA's total Computer Systems Division payroll down to about 7,000 from a peak of about 12,000.

Computer Firms Can Use Commercial Credit Insurance

By A.A. Dilworth

Special to Computerworld

The 1970 credit-profit squeeze slump left in its wake a concern over corporate liquidity, adequacy of working capital turning over healthily, and slow collections of accounts receivable.

In a time of expansive sales it is more important than ever to collect debts promptly so that the hardware or software company can roll over its working capital efficiently to support sales growth.

Protection of working capital is provided by commercial credit insurance on accounts receivable. It puts a known, guaranteed value on accounts receivable for a stop-loss against the unexpected, abnormal credit default which damages working capital and can be dangerous.

Measure of Control

This insurance cannot guarantee profit, yet it does provide a measure of control over the contemplated profit. It does not substitute for good credit analysis, but is instead a back-up of management's credit evaluation function.

It is a "money-back guarantee" against abnormal credit losses that are above the "normal" (deductible) for a particular company. Commercial credit insurance is justifiable regardless of business cycle and how good a client company's credit appears to be at time of shipment.

Ideally it supports maximum sales at minimum risk.

Commercial credit insurance of accounts receivable applies to manufacturing, wholesale, and service-type businesses dealing with industrial/commercial clientele. It does not apply to consumer credit, retail credits to consumers nor to U.S./Canadian exports.

A presumed "safe" customer can get into financial distress for various reasons – judgmental faults, loss of key men, market disruption, product obsolescence or faulty design in a time of swift technology, as in the computer industry.

Continuance of Inventory

Property insurance is carried on physical assets because management owns these, from plant and equipment all the way through materials, production and inventory. The account receivable is really inventory one step forward: a continuance of inventory.

Viewpoint

When a sale, shipment and delivery are made, the title passes to the purchaser and so does the right to insure.

When that new entity, the account receivable, is given a guaranteed value, the supplier's cycle of insurance protection is complete, all the way from cash invested to cash returned into working capital.

As an operating expense credit insurance costs a fraction of 1% of annual sales, and the deductible depends on company philosophy, character and scope of accounts that are insurable, and related factors.

The cost is relatable, from a supplier's viewpoint, to the cost-effectiveness of the cash discount for prompt payment. The cash discount's purpose is to get in collections quickly to cut down the finance charges of carrying receivables. How truly effective was the cash discount as an inducement for quick paying during 1969-71?

Hidden Factors

There are, of course, hidden factors in analyzing a financial position relative to insurability of credit risks covering a supplier's customer. The customer's financial statement may be months old.

It is usually taken for granted that the financial position today is a continuation of the past. At best, a financial statement is an estimate or opinion of a company's operating condition as of a certain date.

The credit insurer has learned the hard way that it is the so-called "good customer" who is prone to cause the embarrassing shock of a credit default. The marginal customer account is kept under close watch for paying.

To the insurer this is akin to fidelity bonding of the "trusted and loyal" employee who is beyond suspicion about honesty, and yet brings on the dismay of dishonesty with his employer's money. It is like that with business debts.

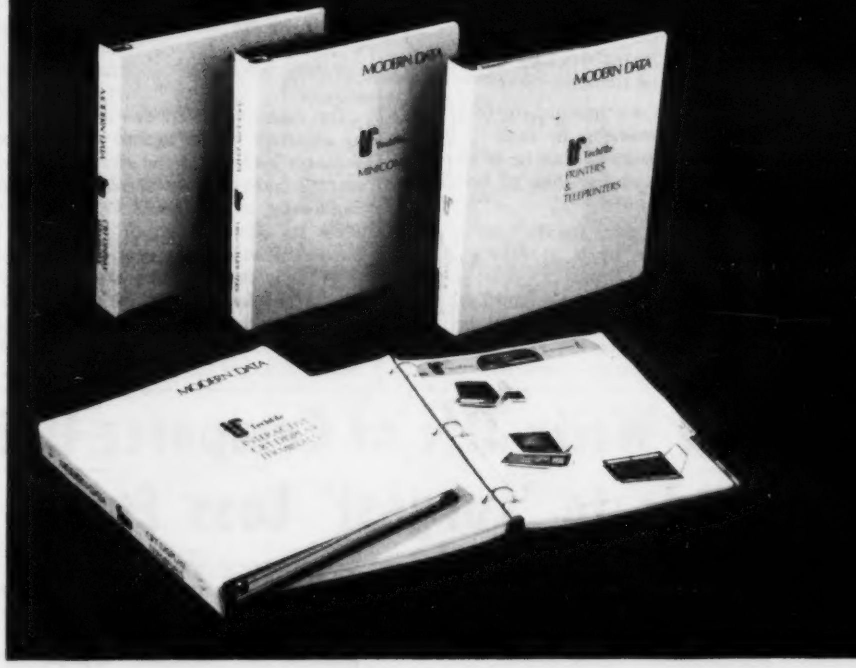
Advantages

There are significant advantages when accounts receivable are given a guaranteed value:

- Working capital is not tied up in seriously delinquent accounts.
- Turnover of working capital is enhanced, with what that implies to profitability.
- Collection procedure is strengthened. The commercial credit insurer has experience, credit information, collecting systems and the how-to-do-it of third party interest. Many managements do not know where to begin, nor do they have the personnel, to oversee all the credit extensions to all customers.
- A policy holder can aggressively use this protective umbrella to acquire new customers and build up sales volume in a prudent way.
- Better salvage of insolvent accounts is attainable.
- The credit insurer's name reinforces the insured's own collections. The threat of third party intervention is effective.
- The insured company's own financial statement is strengthened. Put an asterisk on the item of accounts receivable citing that the accounts have a known, guaranteed value. To the bank lender it is like seeing a co-maker on a loan to an individual.
- Suppliers to the insured are impressed and may enlarge their lines of credit.
- The insurance company's opinion is available on credit worthiness of particular customers . . . the large or unusual ones.
- Cost estimate of products shipped can be better estimated.
- A large excess bad debt reserve is provided for bolstering the management's own bad debt reserve. Credit insurance supplements normal bad debt loss reserve in the bookkeeping figures.

Properly used, commercial credit insurance is much more than just "working capital protection," "bad debt," or "insolvency" insurance as it is commonly called. Wisely and aggressively used it is a tool enabling management to build sales prudently.

A.A. Dilworth is chairman of the board of American Credit Indemnity Co., Baltimore, Md.



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a message for data processing managers

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Xerox Data Unveils Mini-Midi Disk Unit

EL SEGUNDO, Calif. – A disk storage unit for use in design of mini and midi computer systems has been announced by the System Products Department of Xerox Data Systems.

Available in three models, the rack-mountable, fixed-head Xerox 727 Mini Discs range in storage capacity from 0.8 Mbits to 3.2 Mbits. All models feature an access time of 8.3 msec and a data transfer rate of 3 Mbit/sec. The models have 16, 32 or 64 data tracks.

A typical unit sells for $6,000 in small quantities. Deliveries are scheduled to begin in November from the firm at 701 S. Aviation Blvd.

Varian Hard-Copy Camera/Printer Bows

PALO ALTO, Calif. – An electrophotographic camera/printer designed to produce hard copies in 14 seconds or less from mass information storage and retrieval stations and computer graphic terminals is being manufactured by Varian.

The photographic speed of the Model 10 Electrographic Printer in producing copies from high-resolution CRT displays is said to be 60 to 100 times that of commonly used zinc-oxide photoconductors.

The process uses no silver, and exposures are made without the use of a mechanical shutter. During exposure, a voltage is applied to a photoconductive plate causing an electrostatic charge to be transferred to dielectric-coated, bond-like paper. Additional copies are made at the rate of one every 7 seconds.

Cost per copy is under 5 cents. The unit price of the Model 10 is about $3,500 in OEM quantities and includes a roll-fed paper transport, exposure module, toning section, dryer, paper cutter, power supplies and control circuitry. The CRT source and optics are not included since the unit is designed for inclusion in a system package.

The firm is at 611 Hansen Way, 94303.

TEL Shows Mini Line Printer

TOKYO, Japan – Tokyo Electron Laboratories, Inc.'s Model-4100, a medium-speed line printer, is designed for minicomputer systems. Print speed is 300 line/min with 128 char./line. The unit can provide up to five copies. The standard drum has 64 character set but custom design is available for OEM quantity.

The unit features 10 char./in. and 6 line/in. The paper feed time is 24 msec per line and the paper slew time is 10 in./sec.

New OEM Products

Information is available from the firm at Meiho Bldg., 22 Nishi Shinjunku 1-chome, Shinjuku-ku.

64-bit Bi-Polar RAM Is Scratch-Pad Memory

SUNNYVALE, Calif. – A 64-bit read-write random access memory organized as 16-words of 4 bits each is now available from Signetics for use in scratch pads and buffer memories.

Words are selected through a 4-input binary decoder when the chip select input is at logic "0." Data is written into the memory when Read Enable is at logic "0" and read from the memory when RE is at logic "1."

The outputs of the 8225 are logical "1" during write operation and inputs and outputs can be connected in common through busses to reduce the number of I/O leads.

Other features include 35 nsec access time. The 8225 is DTL and TTL compatible. Inputs are one TTL load. Outputs sink 16 mA and the device also features "OR-tie" capability.

Standard packaging in the form of a 16-pin dual-in-line configuration and a 16-pin flat pack are used. The DIP is made either with Dow-Corning plastic or ceramic. Unit price of the N8225B, which consists of the RAM packaged in a silicone plastic DIP, is $6.94 when ordered in quantities between 100 and 999 from the firm at 811 E. Arques Ave., 94086.

A-D Converters Debut

PHOENIX, Ariz. – A series of analog to digital converters has been announced by Phoenix Data, Inc.

The ADC 900 series utilizes the technique of voltage-switching successive-approximation. Series ADC 900 units are available, in 8-, 10-, or 12 bit binary configurations with four input voltage ranges offered as standard. Options offered include a high-speed, high-input impedance buffer amplifier, and units with an extended operating range.

The ADC 912, in quantities 1 to 5, is priced at $1,200, the ADC 910 at $1,000, and the ADC 908 at $800. Delivery on standard models can be made within four weeks from the company at 3384 W. Osborn Rd., 85021.

Fed Needs Education...RCA Gets GSA Pact...Japanese DP Rises

DC Wrapup

WASHINGTON, D.C. – "Information concepts are new to most federal agencies," said Dr. Lee Burchinal, assistant commissioner, Center for Educational Communications, U.S. Office of Education. "The Information Industry Association as an organization has an education job on its hands.

"Five years ago," the OE official said, "we had never even heard of microfiche in our agency."

GAO's Edward J. Mahoney, deputy director of ADP, talked about the government's procurement of computer software and concentrated on the GAO's report to Congress on acquisition and use of software [CW, July 21]. " A whole series of follow-on reports will be coming out on how the government is using software," he added.

RCA Gets GSA Pact

RCA, which plans to continue to do business with the Federal Government in the computer area, has received its General Services Administration contract for fiscal year 1972. The contract, for $18 million, is about $6 million under a year ago because of conversion of rental to purchase of equipment in fiscal 1971.

Jobless Rate Rises

The unemployment rate this past summer for engineers specializing in the computer area was 3.7%, according to a survey conducted by the Engineers Joint Council for the National Science Foundation. As expected those in aerospace and electronics engineering had an unemployed rate of 5.3%, the highest of any field.

Xerox to Build School

Xerox Corp. has asked suburban Loudoun County, Va., for permission to build a $30 million technical and sales training school on a site near Dulles Airport.

The complex, which would be completed over a seven-year period, would train students in Xerox's complete line of products, including computers. The facility would house up to 1,200 full-time students who would stay up to three months at the site. A staff of about 300 would be employed. Groundbreaking is scheduled for early next month.

Japanese Industry Up

The Japanese communications and electronics industry continues its sharp gains, the U.S. Department of Commerce's Bureau of Domestic Commerce reports. Electronic computers showed a spurt of 59%, rising from $544 million in 1969 to $862 million in 1970. The growth rate of telecommunications equipment in the Japanese market rose 5% in the same period.

SDC Wins GSA Award

The General Services Administration has awarded a $209,000 contract to develop a nationwide information system for its Public Buildings Services (PBS) to System Development Corp. of Falls Church, Va.

When operational, the computerized service would provide immediate information on all construction and management programs of PBS. The system would handle all phases of the PBS function, including cost accounting for every expenditure in the annual budget of $1 billion.

PBS is charged with construction and management of the 10,000 buildings occupied by government workers throughout the country, and according to GSA the computerized system will replace "burdensome and time-consuming manual reporting systems. It will provide a considerable savings in terms of time and money." No figures were given.

Must Consider User Needs

Matching Mini Peripherals To Minicomputers Is Hard

SAN FRANCISCO – The problems of matching peripherals to minicomputer systems has led to failure to meet user problems adequately and caused many users to operate their equipment only part of the time, according to George King, editor of *Electromechanical Design* magazine, who spoke here recently.

The major peripheral device problems currently faced by the minicomputer manufacturers, according to Tenny Lode of Electronic Processors Inc., are: the inability of many peripherals to function as advertised; electrical noise sensitivity and/or generation; the lack of verification capability; and the lack of interface standardization.

At the same time, Richard H. Drew of Computer Automation, Inc. noted that the minicomputer "is coming closer to the peripheral. I/O processors have long been used to manage peripherals," he said, but "now each high performance peripheral can afford its own computer."

The concept would be to have the minicomputer in the peripheral function as an elaborate controller or interface to translate, monitor, and "tame" the peripheral.

Master or Slave?

This evolution is being made possible by economics, he noted, with minicomputers decreasing in cost "often faster and farther than electromechanical peripherals . . . When this is true we must free ourselves of old concepts about which is the master and which is the slave.

"The lack of a full range of hardware and software from any one mini equipment manufacturer has placed unusual burdens on both users and systems designers of minicomputer systems," stated Arnold L. Mende, president of the Genesis Venture Capital Group Inc.

He said that "for many who have tried building a business system around a mini mainframe, the experience has been frustrating and often disappointing."

From a user's point of view the most serious shortcomings of the mini makers is their failure to offer a product line with a full range of peripherals and interfaces, he said, in addition to a lack of operating systems and application packages.

Mende also noted that the OEM share of the market is shrinking and that "the conclusion is clear: offer a total line or prepare to be scrapping for a small share of the market."

The mini manufacturer, he said, should remember that in general the end user of a mini system is unsophisticated; "he desperately needs help, he lacks internal resources, he is relying on you."

The manufacturer should make it easy for the user to create total systems which are easy to build, easy to use; and which compare favorably in total costs with the direct labor they are replacing, Mende said.

The manufacturers should also concentrate on the total application rather than on just product features, he said. "The mass market isn't like early markets of scientists and engineers who demanded more performance and appreciated it when you delivered. The new markets understand their business, not yours."

In addition, Mende claimed that "usability and comprehensiveness are even more important than price to the mass market," and he warned that "frills don't sell to the new market."

The last 5% of the performance in a component is less important than a successful cost effective system.

Computer Voting Pushed

LOS ANGELES – Computer-based punched card election systems are the least expensive form of vote tabulation, according to a survey by Systems Research Inc.

The average county spends $2.47 annually per registered voter, the firm said, but noted that firms using the computerized systems spend only $1.36 per registrant while counties using lever voting machines pay $4.58 per voter.

IBM Scores Revenue, Earnings Records, But Growth Is Coming at Slower Rate

ARMONK, N.Y. – IBM reported record earnings and revenues in both the quarter and nine-month periods ended Sept. 30. But the third quarter was relatively flat in both earning and revenue increases, following a flat second quarter [CW, July 21].

In relation to the preceding quarter, Chairman T. Vincent Learson said, "There have been no material changes in the trends previously reported to stockholders. Net orders booked continue to be adversely affected by a high rate of discontinuance of data processing equipment formerly installed on a rental basis. This appears to be largely due to economic conditions."

After-tax earnings for the nine-month period reached $772.8 million, $6.72 per share, compared with net income of $742.3 million, $6.51 per share, in the comparable year earlier. Revenues for the nine-month periods were $5.9 billion and $5.5 billion respectively.

Rental, Service Up

While the total gross income rose by only 7% in the nine-month period, Learson noted there was an "increase of 12.5% in rental and service gross income over the corresponding nine months of 1970."

For the quarter, earnings remained relatively flat at $266.9 million, $2.31 per share, compared with last year's $259.9 million, $2.27 per share. Gross reached just over $2 billion, up from $1.9 billion.

During the second quarter earnings had remained completely static on a per share basis at $2.22, even though they had inched up to $255.1 million from $252.1 million in the same quarter a year earlier. However, IBM managed to set overall records in the first half, just as it did in the first three quarters.

Acquisitions

Computer Resources Inc. of Cleveland, a company providing computer related services, has acquired a majority interest in **LT Tax Services, Inc.** of New York through an exchange of stock. The subsidiary will operate under the name Tax Resources, with headquarters in New York.

PRC Computer Center, Inc., a Planning Research Corp. company, has acquired **Pharmacy Computer Billing** (PCB) of Encino, Calif. Terms were not disclosed.

Systems Science Development Corp. (SSDC) has been merged into **Planning Research Corp.** and will operate as a subsidiary of PRC Information Sciences Company. SSDC specializes in the development of law enforcement information systems.

Computer Management Inc., (CMI) Cleveland, Ohio, has acquired the **COM Division** of Superior Microfilm Inc., Pittsburgh, Pa. Micro-Com, Inc., the COM division of CMI, will operate the new division.

United Data Centers, Inc. (UDC) has agreed in principle to acquire **Dynafacts, Inc.** Both companies operate a network of data centers; Dynafacts also produces an automated tax return system. The transaction is subject to approval by the boards of directors of both companies. Simultaneously, UDC's Montreal subsidiary, **Tronics Inc.**, has purchased the business of EDP Industries Ltd.'s **Montreal data center.**

CGA Computer Associates, Inc. has acquired **Nevis-Wallen Associates**, a management consulting firm specializing in human resources training and development, and **Danzig-Nevis International**, a company that develops educational products and training programs for professional and management development. The transactions were for cash and common stock.

Comserv Corp. has completed the acquisition of **Compac Computer Systems,** following approval by Compac shareholders. The transaction involved the issuance of 58,000 shares of Comserv common stock to Compac.

Electronic Associates, Inc. (EAI) of West Branch, N.J., has acquired **Analog Training Computers, Inc.**, distributor of the ATC Flight Simulator. The transaction involved an exchange of 35,000 shares of EAI common stock plus purchase of all designs, patent applications and manufacturing rights of the training simulator. ATC retains sales and distribution rights. EAI manufactures digital, analog/hybrid computer systems and provides software and services.

New Registrations

TRIVEX INC., 2201 N. Glassell St., Orange, Calif., a company primarily engaged in the design and manufacture of precision mechanical and electronic computer components and systems, filed to register 275,000 shares of common stock. Proceeds, at $9 per share maximum, to be used to repay short-term bank loans and the balance for working capital and other corporate purposes. The underwriter is Mitchum, Jones & Templeton, Inc., 510 Spring St., Los Angeles, Calif. 90013.

ADVANCED MEMORY SYSTEMS, INC., 1276 Hammerwood Ave., Sunnyvale, Calif., a company engaged in the design, development, manufacture and marketing of components, subsystems and systems for use primarily in digital computers, filed to register $3 million of convertible subordinated debentures, due 1991; 27,000 shares of common stock, and 235,905 shares of common stock issuable pursuant to the company's Incentive Stock Option Plan. Proceeds, at $15 per share maximum and 100% of principal amount on the debentures, to be used for new product development and the balance for working capital and other corporate purposes. The underwriter is Hambrecht & Quist, 235 Montgomery St., San Francisco, Calif. 94104.

GRAHAM MAGNETICS INC., Graham, Texas, a company that manufactures, distributes and sells precision magnetic tapes for use in the computer industry, filed to register 200,000 shares of common stock. Proceeds, at $25 per share maximum, intended for construction of plant, purchase of equipment and related activities, and the balance for working capital and other corporate purposes. The underwriter is Estabrook & Co., Inc., 80 Pine St., New York, N.Y. 10005.

CALIFORNIA COMPUTER PRODUCTS, INC., 2411 W. La Palma Ave., Anaheim, Calif., a company engaged in the computer peripheral equipment business, filed to register 500,000 shares of common stock. Proceeds, at $18.375 per share maximum, to be used to reduce short-term bank loans, augment working capital and other corporate purposes. The underwriter is A.G. Becker & Co., Inc., 1901 Building, Century City, Los Angeles, Calif.

COMPUTER NETWORK CORP., 5185 MacArthur Blvd., N.W., Washington, D.C., a company primarily engaged in providing remote access and batch computing services on a time-shared basis, filed to register 225,000 shares of common stock. Proceeds, at $10 per share maximum, to be used to retire notes held by banks and the balance for working capital and other corporate purposes. The underwriter is Ferris & Co., Inc., 1720 Eye St., N.W., Washington, D.C. 20006.

TRADE*QUOTES

Computerworld Stock Trading Summary

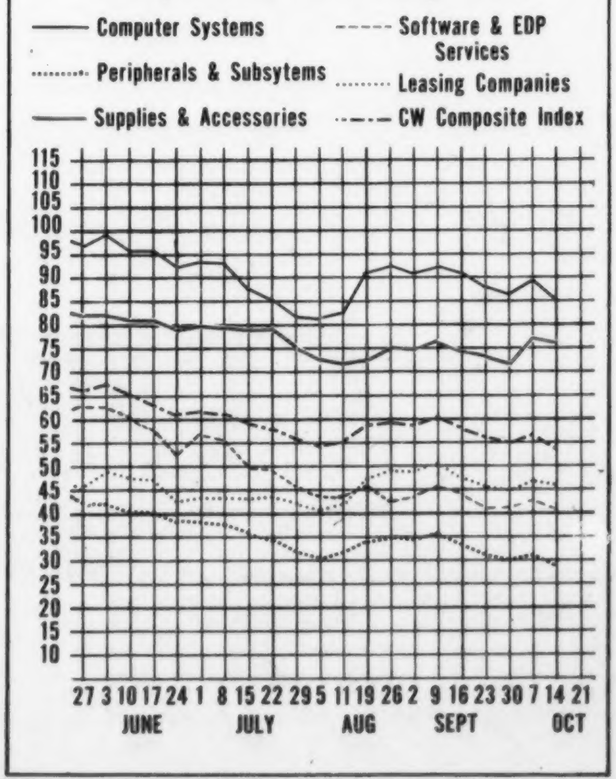
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, OCTOBER 14, 1971

EXCH		PRICE 1971 RANGE (1)	CLOSE OCT 14 1971	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	2	+ 1/8	+6.6
A	APPLIED DATA RES.	5- 13	6	- 1/2	-7.6
O	APPLIED LOGIC	1- 3	5/8	0	0.0
N	AUTOMATIC DATA PROC	44- 66	64	+ 1/2	+0.7
O	AUTO SCIENCES	1- 8	1 3/4	+ 1/8	+7.6
O	COMPUTER NETWORK	2- 11	6 1/2	-1 1/2	-18.7
O	COMPUTER PROPERTY	5- 11	6	+ 3/4	+14.2
N	COMPUTER SCIENCES	8- 17	7 3/4	- 1/4	-3.1
O	COMPUTER TECHNOLOGY	5- 11	6 7/8	- 1/4	-3.5
O	COMPUTER USAGE	5- 16	6 7/8	- 1/4	-3.5
O	COMP AUTOMOT REPORTS	6- 13	8 1/4	0	0.0
N	COMPUTING & SOFTWARE	22- 45	21 7/8	-2 1/8	-8.8
O	COMRESS	2- 4	2	+ 3/8	+23.0
O	COMSHARE	4- 8	4 3/8	- 1/8	-2.7
O	DATA AUTOMATION	1- 4	7/8	- 1/8	-12.5
O	DATA PACKAGING	6- 10	7 5/8	0	0.0
O	DATAMATION SERVICE	1- 3	1/2	- 3/8	-42.8
L	DATATAB	4- 10	6 1/4	- 3/8	-5.6
O	EDP RESOURCES	7- 16	7	-2 1/4	-24.3
A	ELECT COMP PROG	2- 7	2 1/4	- 3/8	-14.2
N	ELECTRONIC DATA SYS.	48- 85	47 5/8	-3 1/4	-6.3
O	INFORMATICS	7- 15	8 5/8	- 1/4	-2.9
O	I.O.A. DATA CORP	1- 3	1 1/4	0	0.0
A	ITEL	7- 23	7 3/4	-2 3/8	-23.4
O	KEANE ASSOCIATES	4- 14	6	-1	-14.2
O	KEYDATA CORP	7- 14	6 3/4	- 3/8	-5.2
A	MANAGEMENT DATA	7- 11	6 7/8	- 3/4	-9.8
O	NATIONAL CSS INC	7- 14	7 1/2	- 3/4	-9.0
O	NAT COMP ANALYSTS	1- 4	3/4	- 1/4	-25.0
P	ON LINE SYSTEMS INC	7- 18	10	+ 1/2	+5.2
N	PLANNING RESEARCH	14- 26	14 1/4	-2 1/8	-12.9
O	PROGRAMMING METHODS	17- 29	17	-1 1/2	-8.1
O	PROGRAMMING & SYS	2- 4	1 7/8	+ 1/8	+7.1
O	SCIENTIFIC COMPUTERS	2- 3	2 3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 4	3 3/4	0	0.0
O	SOFTWARE SYSTEMS	1- 3	1	- 1/4	-20.0
O	TBS COMPUTER CENTERS	4- 9	6 3/4	+ 1/2	+8.0
O	TOLLEY INTL CORP	3- 8	5 7/8	- 1/4	-4.0
O	TRACOR COMPUTING	2- 5	2 1/2	- 1/8	-4.7
O	TYMSHARE INC	4- 15	8 1/2	-1 1/4	-12.8
O	UNITED DATA CENTER	2- 7	5 3/4	+ 5/8	+12.1
N	UNIVERSITY COMPUTING	21- 38	21 1/4	-3	-12.3
A	URS SYSTEMS	6- 11	6 5/8	+ 3/4	+12.7
O	VORTEX CORP	2- 6	5 1/2	+ 1/4	+4.7
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	24- 48	35 5/8	-2 5/8	-6.8
O	ALPHANUMERIC	2- 6	1 3/4	- 1/8	-6.6
N	AMPEX CORP	14- 25	14 3/4	- 5/8	-4.0
O	ANDERSON JACOBSON	6- 10	6 1/4	- 5/8	-9.0
O	ATLANTIC TECHNOLOGY	3- 8	4 1/2	- 3/4	-14.2
A	BOLT,BERANEK & NEW	5- 8	5 1/8	+ 1/8	+2.5
N	BUNKER-RAMO	7- 17	7 1/4	- 1/8	-1.6
A	CALCOMP	16- 33	17 1/8	0	0.0
O	COGNITRONICS	3- 9	2 1/2	0	0.0
O	COLORADO INSTRUMENTS	2- 8	2 1/4	- 1/4	-10.0
O	COMPUTER COMMUN.	6- 19	7 3/4	-1	-11.4
A	COMPUTER EQUIPMENT	3- 7	3 1/4	- 1/2	-13.3
A	COMPUTEST	5- 20	5 3/8	-1 3/8	-20.3
O	CONSOL COMPUTER LTD.	2- 12	2 1/8	+ 1/8	+6.2
A	DATA PRODUCTS CORP	4- 10	4 1/8	- 5/8	-13.1
O	DATA RECOGNITION	3- 8	5 3/4	+ 1/4	+4.5
O	DATA TECHNOLOGY	3- 9	4 1/4	- 1/8	-2.8
O	DIGITRONICS	2- 8	2 1/4	- 1/4	-10.0
N	ELECTRONIC M & M	7- 16	7 3/8	-1	-11.9
O	FABRI-TEK	2- 4	2 3/4	0	0.0
O	GENERAL COMPUTER SYS	6- 10	9	+ 1/2	+5.8
N	GENERAL ELECTRIC	53-124	61 5/8	-2 3/8	-3.7
O	INFOREX INC	23- 49	26 1/4	0	0.0
O	INFORMATION DISPLAYS	4- 8	4	- 3/4	-15.7
O	MANAGEMENT ASSIST	1- 2	3/4	0	0.0
A	MARSHALL INDUSTRIES	11- 27	10 7/8	-2	-15.5
N	MEMOREX	27- 78	31 1/2	-3 3/4	-10.6
A	MILGO ELECTRONICS	12- 26	16 1/4	+1	+6.5
N	MOHAWK DATA SCI	21- 47	21	-4 1/4	-16.8
O	OPTICAL SCANNING	7- 18	7 1/8	- 5/8	-8.0
O	PHOTON	7- 12	7 1/2	- 3/4	-9.0
A	POTTER INSTRUMENT	13- 25	15	-1	-6.2
O	PRECISION INST.	7- 16	11	0	0.0
O	RECOGNITION EQUIP	12- 26	13 1/4	- 7/8	-6.1
O	REDCOR CORP.	1- 9	2	- 3/8	-15.7
N	SANDERS ASSOCIATES	10- 22	11	-1	-8.3
O	SCAN DATA	6- 15	10 7/8	- 3/4	-6.4
O	TALLY CORP.	8- 16	9 1/2	+ 1/8	+1.3
N	TELEX	12- 22	12 3/8	- 1/2	-3.8
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	12- 19	12	-1 1/4	-9.4
O	BALTIMORE BUS FORMS	6- 10	8 1/2	+ 1/4	+3.0
A	BARRY WRIGHT	7- 13	8	+ 1/8	+1.5
A	DATA DOCUMENTS	15- 29	16 1/2	- 1/2	-2.9
O	DUPLEX PRODUCTS INC	8- 11	10 3/4	- 3/8	-3.3
N	ENNIS BUS. FORMS	6- 13	6 5/8	0	0.0
O	GRAHAM MAGNETICS	9- 35	23	+1 3/4	+8.2
O	GRAPHIC CONTROLS	6- 15	12 3/8	-1	-7.4
N	3M COMPANY	96-126	123 5/8	- 1/4	-0.2
O	MOORE BUS. FORMS	36- 42	37 5/8	-1 1/8	-2.9
N	NASHUA CORP	29- 47	46 5/8	+1 3/8	+3.0
O	REYNOLDS & REYNOLD	37- 63	61 1/2	- 3/4	-1.2
O	STANDARD REGISTER	16- 23	16 1/4	- 1/2	-2.9
O	TAB PRODUCTS CO	8- 17	16 1/2	+ 3/4	+4.7
N	UARCO	25- 34	26 1/2	0	0.0
A	WABASH MAGNETICS	6- 10	6 1/8	0	0.0
N	WALLACE BUS FORMS	18- 26	22 1/8	- 3/8	-1.6
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	105-143	137	-5 1/8	-3.6
N	COLLINS RADIO	12- 20	12 1/2	-1	-7.4
N	CONTROL DATA CORP	43- 83	43 7/8	- 5/8	-1.4
O	DATA GENERAL CORP	19- 65	52 5/8	-6 1/8	-10.4
O	DIGITAL COMP CONTROL	4- 24	17 1/4	- 1/4	-1.4
N	DIGITAL EQUIPMENT	53- 85	69 1/4	-8 1/4	-10.6
N	ELECTRONIC ASSOC.	5- 9	5 1/2	- 1/4	-4.3
A	ELECTRONIC ENGINEER.	5- 10	9 3/8	- 3/4	-7.4
N	FOXBORO	25- 46	39 1/2	-1	-2.4
O	GENERAL AUTOMATION	9- 26	15	0	0.0
N	HEWLETT-PACKARD CO	30- 46	44 1/4	-1 7/8	-4.0
N	HONEYWELL INC	83-115	112	+3 5/8	+3.3
N	IBM	284-364	307 3/4	- 3/4	-0.2
O	INTERDATA INC	6- 11	9 1/4	0	0.0
N	NCR	31- 49	30 1/2	-2 1/2	-7.5
N	RCA	26- 41	34 5/8	-2 1/8	-5.7
N	RAYTHEON CO	27- 46	36 3/8	- 7/8	-2.3
N	SPERRY RAND	25- 38	24 5/8	-3 1/8	-11.2
A	SYSTEMS ENG. LABS	8- 18	9	-1	-10.0
N	VARIAN ASSOCIATES	13- 18	15 1/8	+ 3/4	+5.2
N	VICTOR COMPTOMETER	14- 27	14 3/8	-1 7/8	-11.5
N	WANG LABS.	29- 50	37 5/8	-4 3/8	-10.4
N	XEROX CORP	85-121	114	-1 3/8	-1.1
	LEASING COMPANIES				
A	BOOTHE COMPUTER	13- 27	15 3/4	- 7/8	-5.2
O	BRESNAHAN COMP.	2- 4	2 1/4	- 1/4	-10.0
O	COMPUTER EXCHANGE	3- 9	3	- 1/8	-4.0
A	COMPUTER INVSTRS GRP	8- 14	9 1/2	- 3/8	-3.7
N	DATA PROC. F & G	11- 19	10 3/4	-1 1/8	-9.4
O	DATRONIC RENTAL	2- 4	2 5/8	- 1/8	-4.5
A	DCL INC	5- 13	7	-1	-12.5
A	DEARBORN+STORM	24- 45	42 1/2	-1 1/4	-2.8
A	DPA, INC.	4- 9	9	+1	+12.5
A	GRANITE MGT	7- 13	9 3/8	- 5/8	-6.2
A	GREYHOUND COMPUTER	7- 11	8	- 5/8	-7.2
N	LEASCO CORP	16- 26	24 7/8	- 1/8	-0.5
O	LECTRO MGT INC	2- 5	3 1/2	+ 1/8	+3.7
O	NCC INDUSTRIES	3- 8	6 3/4	- 1/8	-1.8
A	ROCKWOOD COMPUTER	4- 9	4 1/8	- 3/8	-8.3
O	SYSTEMS CAPITAL	3- 7	5 7/8	+1 1/4	+27.0
N	U.S. LEASING	16- 39	35 5/8	- 3/8	-1.0

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

PROGRAMMED PROPRIETARY SYSTEMS

Year Ended May 31

	1971	a1970
Shr Ernd	.....	$.20
bRevenue	$2,003,592	2,535,210
Spec Chg	65,111	.....
Earnings (Loss)	(569,829)	300,198

a-Restated to reflect discontinued operations. b-From continuing operations.

ADVANCED MEMORY SYSTEMS

Nine Months Ended June 30

	1971	1970
Revenue	$1,042,463	$243,149
Loss	1,424,288	1,538,104

DELTA DATA SYSTEMS

Three Months Ended June 27

	1971	1970
Shr Ernd	$.01	.....
Revenue	555,302	$167,490
Earnings (Loss)	a9,250	(466,504)

a-Includes a tax-loss carryforward of $2,313.

FABRI-TEK

Three Months Ended July 2

	1971	a1970
Revenue	$4,598,670	$5,536,986
Spec Cred	b1,897,435	.....
Earnings (Loss)	c1,472,171	(106,448)

a-Restated to reflect operations of Fabri-Tek Micro System Inc., not previously consolidated. b-Gain on sale of Nicolet Instrument Corp. c-Equal to 46 cents a share.

SANDERS ASSOCIATES

Year Ended July 31

	1971	1970
Shr Ernd	.....	$.17
Revenue	$146,415,000	173,595,000
Earnings (Loss)	a(24,630,000)	782,000

a-After giving effect to a special charge of $15,370,000, mainly due to changes in accounting methods.

SYNTONIC TECHNOLOGY

Year Ended June 25

	1971	1970
Shr Ernd	$.42	$.18
Revenue	6,179,000	a4,886,000
Earnings	198,700	a82,500

a-After provision for Penn Central receivable.

SYSTEMS COMPUTER CORP.

Six Months Ended June 30

	1971	1970
Revenue	$404,155	$316,547
Earnings (Loss)	878	(42,532)

TEKTRONIX

Three Months Ended Aug. 21

	1971	1970
Shr Ernd	$.24	$.30
Revenue	35,299,000	33,956,000
Earnings	1,936,000	2,428,000

GRAPHIC SCIENCES

Year Ended June 30

	1971	1970
Revenue	$8,708,942	$6,791,270
Loss	a3,327,148	4,217,226

a-After deduction of approximately $3,420,000 consisting of $3,180,000 write down of third generation computer equipment of a subsidiary to estimated recoverable rental value, and an extraordinary item of $240,000 provision for loss on investment.

COMPUTER DATA SYSTEMS

Year Ended June 30

	1971	1970
Shr Ernd (Loss)	$.02	$(.34)
Revenue	1,110,100	789,200
Earnings (Loss)	9,500	(198,800)

DATA-DESIGN LABORATORIES

Year Ended June 30

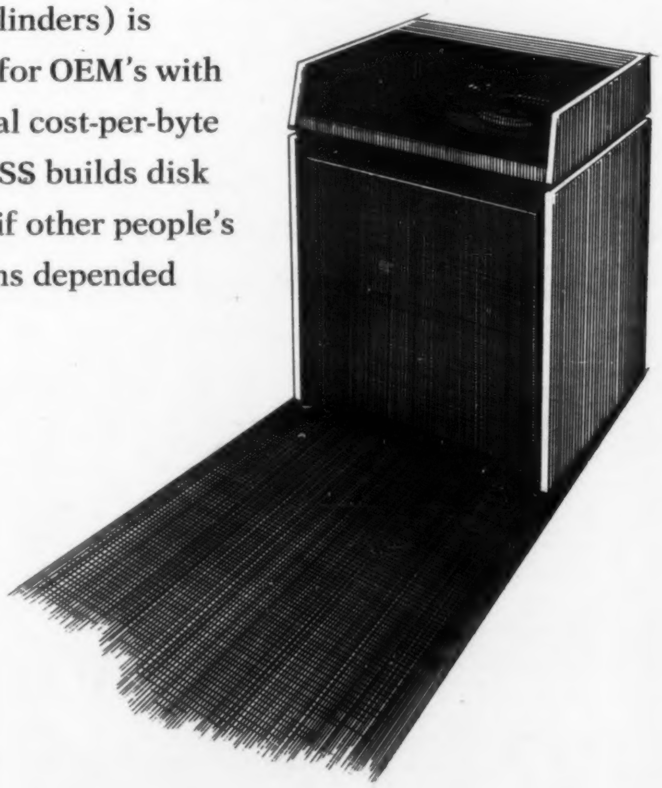
	1971	a1970
Shr Ernd	.....	$.35
bRevenue	$7,035,108	6,179,270
Earnings (Loss)	(691,316)	386,745

a-Restated to reflect discontinued operations. b-From continuing operations.

About Reputations-Yours and Ours

People have a way of remembering bad news long after they have forgotten good news. This axiom applies to people, products and affairs of state. This is why OEM companies are so judicial in selecting their suppliers. No responsible firm will risk lowering customer confidence by offering less than the finest products and services. Which helps explain why you can count on a company that always demands the very best from its suppliers.

Information Storage Systems is such a supplier and we manufacture disk drives that are compatible with most mainframe requirements. The 714 is setting new standards of performance for 11-high disk pack drives in thousands of installations. Now the 715, with double the storage capacity (58 million bytes on 400 cylinders) is available for OEM's with substantial cost-per-byte savings. ISS builds disk drives as if other people's reputations depended on them.



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Information Storage Systems

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